

**2016 Risk Assessment Mitigation Phase
Investigation 16-10-016
Workpapers to
Catastrophic Damage Involving a
Medium-Pressure Pipeline Failure
(Chapter SCG-10-WP)**

January 2017



2016 Risk Assessment Mitigation Phase
SCG-10-WP
Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure (O&M)

Line No.	Mitigation	Project/Program	Project/Program Description	Recorded (Directs, 2015 \$000)						Forecast Range (Directs, 2015 \$000)						Forecast Methodology
				Status	2011	2012	2013	2014	2015	2017 Low	2017 High	2018 Low	2018 High	2019 Low	2019 High	
1	Maintenance	Leak Survey (Per Region)	Leak surveys are performed to find any leaks in the system using state of the art technology and SAP leak reporting for tracking purposes. This is mandated by the Federal Code of Regulation (CFR) 49 Part 192 Subpart M.	B	\$ 6,117	\$ 7,155	\$ 7,913	\$ 9,412	\$ 8,599	\$ 11,400	\$ 12,600	\$ 12,113	\$ 13,388	\$ 12,825	\$ 14,175	Trend
2		Meter Set Assembly (MSA)	Maintenance and inspections of meter set assemblies in the system. These inspections are performed per region basis. This is mandated by CFR 49 Part 192 Subpart M.	B	2,938	3,723	969	4,120	3,456	4,465	4,935	5,700	6,300	5,700	6,300	Trend
3		Bridge & Span Inspections	Inspect pipelines which cross bridges or spans. Inspections of natural gas pipeline over bridges and land crossings at least once every 2 calendar years, but with intervals not exceeding 27 months. This is mandated by CFR 49 Part 192 Subpart M.	B	20	34	65	92	73	101	112	133	147	133	147	Trend
4		Pipeline Patrol (Per Region)	Pipeline patrol performed to look for any broken terraces, exposed pipe, erosion, sunken back fill, etc. Self audits are performed each month. Any remedial action discovered must be issued within 30 days and completed in 90 days. This is mandated by CFR 49 Part 192 Subpart M.	B	29	63	134	146	156	166	184	181	200	200	221	Trend
5		Measurement and Regulation (M&R) and Maintenance	Inspect meters, regulators, and gauges to evaluate and confirm overpressure protection is in place and maintained. Each pressure limiting station, relief device, signaling device, and pressure regulating station and its equipment must be inspected and tested at intervals not exceeding 15 months, but at least once each calendar year. This is mandated by CFR 49 Part 192 Subpart M.	B	855	978	1,178	1,110	1,160	1,187	1,312	1,273	1,407	1,358	1,501	Trend
6		Unstable Earth Inspection (Per Region)	Mitigation of pipeline rupture due to environmental conditions of soil. This is usually completed at the same time of the valve inspection and maintenance cycle.	B	2	6	10	7	7	8	8	8	8	8	8	Trend
7		Valve Inspection and Maintenance (Per Region)	Valves are checked and serviced at intervals not exceeding 15 months, but at least once each calendar year. (CFR 192.747). Region operations may perform tests and inspections at other times other than the compliance period but cannot be substituted for federally mandated valve inspection in CFR 192.747. This is mandated by CFR 49 Part 192 Subpart M.	B	48	315	869	832	839	804	889	814	899	823	910	Trend

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					2011	2012	2013	2014	2015	2017 Low	2017 High	2018 Low	2018 High	2019 Low	2019 High	
8		Utility Conflict Review (Right of Way)	Inspection of the property area where SoCalGas pipelines are located and addresses encroachment, which is tangible property belonging to either the owner or a third party, which has unlawfully been or will be placed within the Company's right of way. This is mandated by CFR 49 Part 192 Subpart M	B	-	-	-	-	-	-	-	-	-	-	-	
9	Maintenance Subtotal				10,010	12,275	11,137	15,719	14,291	18,132	20,040	20,220	22,349	21,047	23,262	
10	Qualifications of Pipeline Personnel	Distribution Construction Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	675	766	870	792	647	713	788	713	788	713	788	5-Year Average
11		Distribution Energy Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	205	184	271	232	260	219	242	219	242	219	242	5-Year Average
12		Distribution Lead Construction Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	246	259	458	449	319	333	368	333	368	333	368	5-Year Average
13		Distribution System Protection Specialist Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	86	88	92	94	97	87	97	87	97	87	97	5-Year Average
14		Distribution Lead System Protection Specialist Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	
15		Student Labor for attending Distribution-related training classes	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	1,773	2,022	2,234	2,358	2,606	2,695	2,979	Base Year
16	Qualifications of Pipeline Personnel Subtotal				1,211	1,297	1,690	1,567	3,095	3,373	3,728	3,709	4,099	4,046	4,472	
17	Requirements for Corrosion Control	Cathodic Protection (Per Region)	System protection requirements mandated by CFR 49 Part 192 Subpart I. This program maintains cathodically protected assets by repairing, replacing, or retrofitting components.	B	8,493	8,129	8,819	9,771	10,242	11,643	12,869	14,493	16,019	19,243	21,269	Trend
18	Requirements for Corrosion Control Subtotal				8,493	8,129	8,819	9,771	10,242	11,643	12,869	14,493	16,019	19,243	21,269	
19	Operations	Operator Qualification Program Administration and Development	The minimum safety requirements prescribed by CFR 49 Part 192 Subpart L – Operations include locate and mark, emergency preparedness and odorization. These activities are intended to address threats as identified by PHMSA.	B	46	31	13	337	237	380	420	475	525	475	525	Trend
20		Pipeline Safety and Compliance	The minimum safety requirements prescribed by CFR 49 Part 192 Subpart L – Operations include locate and mark, emergency preparedness and odorization. These activities are intended to address threats as identified by PHMSA.	B	472	592	969	1,046	1,076	1,070	1,182	1,098	1,214	1,131	1,250	Trend
21	Operations Subtotal				518	623	982	1,383	1,313	1,450	1,602	1,573	1,739	1,606	1,775	

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				Status	2011	2012	2013	2014	2015	2017 Low	2017 High	2018 Low	2018 High	2019 Low	2019 High	
22	Gas Distribution Pipeline Integrity Management	Distribution Risk Evaluation and Monitoring System (DREAMS)	DREAMS is a refundable program which identifies and remediates non-state-of-the-art (Steel pipe, bare or coated, without cathodic protection (CP), and all DuPont Aldyl-A (PE) pipe installed before 1987) medium-pressure pipe segments based on historical performance (leakage) as well as pipe attributes, construction practices, and relative location to populated areas. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	200	197	18	20	266	253	280	253	280	253	280	Trend
23		Distribution Integrity Management Program (DIMP) DREAMS	Is an accelerated version of the DREAMS program starting in 2013. This program replaces an addition 55 miles a year of non-state-of-the-art pipe using similar tactics as mentioned in the DREAMS model. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	-	-	-	-	-	-	-	-	-	-	-	
24		Gas Infrastructure Protection Plan (GIPP)	GIPP keeps Company assets, commercial buildings, and residential buildings safe from impact damages of distribution gas equipment. This is done by installing protective infrastructure in strategic locations. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	1,430	2,179	3,839	2,900	1,516	2,945	3,255	2,945	3,255	2,728	3,503	Zero Based
25		Anodeless Riser Project/Distribution Riser Integrity Program (DRIP)	The program addresses corrosion, damage, leaks, and improper installation by a third party and promotes remediation full replacement or the installation of a protective coating to eliminate riser damage. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	997	1,117	8,779	7,391	7,038	19,665	21,735	19,665	21,735	20,400	25,200	Zero Based
26		Sewer Lateral Inspection Program (SLIP)	Address a rare but potentially serious case where gas pipelines installed using trenchless technology penetrate sewer laterals in residential areas. State of the art technology is used to locate and replace areas that have been affected. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	3,661	6,169	8,283	4,760	5,710	9,690	10,710	9,690	10,710	10,010	12,100	Zero Based
27	Gas Distribution Pipeline Integrity Management Subtotal				6,288	9,662	20,918	15,070	14,530	32,553	35,980	32,553	35,980	33,391	41,083	
28	TOTAL				\$ 26,520	\$ 31,987	\$ 43,546	\$ 43,509	\$ 43,470	\$ 67,150	\$ 74,218	\$ 72,548	\$ 80,185	\$ 79,333	\$ 91,861	

Notes:

- Baseline (B) and Proposed (P).
- Numbers in risk chapter tables may differ due to rounding.
- The purpose of Risk Assessment Mitigation Phase (RAMP) is not to request funding. Any funding requests will be made in the General Rate Case (GRC). The forecasts for mitigations are not for funding purposes, but are rather to provide a range for the future GRC filing. This range will be refined with supporting testimony in the GRC.

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Line No.	Mitigation	Project/Program	Project/Program Description	Recorded (Directs, 2015 \$000)						Forecast Range (Directs, 2015 \$000)						2017-2019 Low (Sum)	2017-2019 High (Sum)	Forecast Methodology
				Status	2011	2012	2013	2014	2015	2017 Low	2017 High	2018 Low	2018 High	2019 Low	2019 High			
1	Maintenance	Leak Survey (Per Region)	Leak surveys are performed to find any leaks in the system using state of the art technology and SAP leak reporting for tracking purposes. This is mandated by the Federal Code of Regulation (CFR) 49 Part 192 Subpart M.	B	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
2		Meter Set Assembly (MSA)	Maintenance and inspections of meter set assemblies in the system. These inspections are performed per region basis. This is mandated by CFR 49 Part 192 Subpart M.	B	973	732	806	1,153	1,722	1,900	2,400	1,995	2,520	2,233	2,820	6,128	7,740	Trend
3		Bridge & Span Inspections	Inspect pipelines which cross bridges or spans. Inspections of natural gas pipeline over bridges and land crossings at least once every 2 calendar years, but with intervals not exceeding 27 months. This is mandated by CFR 49 Part 192 Subpart M.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Pipeline Patrol (Per Region)	Pipeline patrol performed to look for any broken terraces, exposed pipe, erosion, sunken back fill, etc. Self audits are performed each month. Any remedial action discovered must be issued within 30 days and completed in 90 days. This is mandated by CFR 49 Part 192 Subpart M.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5		Measurement and Regulation (M&R) and Maintenance	Inspect meters, regulators, and gauges to evaluate and confirm overpressure protection is in place and maintained. Each pressure limiting station, relief device, signaling device, and pressure regulating station and its equipment must be inspected and tested at intervals not exceeding 15 months, but at least once each calendar year. This is mandated by CFR 49 Part 192 Subpart M.	B	2,030	179	607	163	311	37	47	37	47	37	47	112	142	Trend
6		Unstable Earth Inspection (Per Region)	Mitigation of pipeline rupture due to environmental conditions of soil. This is usually completed at the same time of the valve inspection and maintenance cycle.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7		Valve Inspection and Maintenance (Per Region)	Valves are checked and serviced at intervals not exceeding 15 months, but at least once each calendar year. (CFR 192.747). Region operations may perform tests and inspections at other times other than the compliance period but cannot be substituted for federally mandated valve inspection in CFR 192.747. This is mandated by CFR 49 Part 192 Subpart M.	B	6	27	2	0	5	11	14	5	6	5	6	21	26	Trend

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					2011	2012	2013	2014	2015	2017 Low	2017 High	2018 Low	2018 High	2019 Low	2019 High			
8		Utility Conflict Review (Right of Way)	Inspection of the property area where SoCalGas pipelines are located and addresses encroachment, which is tangible property belonging to either the owner or a third party, which has unlawfully been or will be placed within the Company's right of way. This is mandated by CFR 49 Part 192 Subpart M	B	301	248	150	377	70	73	92	76	96	95	120	244	308	Trend
9	Maintenance Subtotal				3,310	1,187	1,565	1,693	2,108	2,022	2,554	2,113	2,669	2,370	2,993	6,505	8,217	
10	Qualifications of Pipeline Personnel	Distribution Construction Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11		Distribution Energy Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12		Distribution Lead Construction Technician Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13		Distribution System Protection Specialist Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14		Distribution Lead System Protection Specialist Training	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15		Student Labor for attending Distribution-related training classes	Certification and training that is required for all distribution employees to work on company assets. This is mandated by CFR 49 Part 192 Subpart N.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Qualifications of Pipeline Personnel Subtotal				-	-	-	-	-	-	-	-	-	-	-	-	-	
17	Requirements for Corrosion Control	Cathodic Protection (Per Region)	System protection requirements mandated by CFR 49 Part 192 Subpart I. This program maintains cathodically protected assets by repairing, replacing, or retrofitting components.	B	3,603	2,315	3,660	4,136	3,636	3,454	4,363	4,504	5,689	4,940	6,240	12,898	16,292	Trend
18	Requirements for Corrosion Control Subtotal				3,603	2,315	3,660	4,136	3,636	3,454	4,363	4,504	5,689	4,940	6,240	12,898	16,292	
19	Operations	Operator Qualification Program Administration and Development	The minimum safety requirements prescribed by CFR 49 Part 192 Subpart L – Operations include locate and mark, emergency preparedness and odorization. These activities are intended to address threats as identified by PHMSA.	B	-	-	-	-	10	10	12	10	12	10	12	29	36	Trend
20		Pipeline Safety and Compliance	The minimum safety requirements prescribed by CFR 49 Part 192 Subpart L – Operations include locate and mark, emergency preparedness and odorization. These activities are intended to address threats as identified by PHMSA.	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Operations Subtotal				-	-	-	-	10	10	12	10	12	10	12	29	36	

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22	Gas Distribution Pipeline Integrity Management	Distribution Risk Evaluation and Monitoring System (DREAMS)	DREAMS is a refundable program which identifies and remediates non-state-of-the-art (Steel pipe, bare or coated, without cathodic protection (CP), and all DuPont Aldyl-A (PE) pipe installed before 1987) medium-pressure pipe segments based on historical performance (leakage) as well as pipe attributes, construction practices, and relative location to populated areas. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	58,202	39,074	45,458	29,530	27,557	28,500	36,000	28,500	36,000	28,500	36,000	85,500	108,000	Zero-Based
23		Distribution Integrity Management Program (DIMP) DREAMS	Is an accelerated version of the DREAMS program starting in 2013. This program replaces an addition 55 miles a year of non-state-of-the-art pipe using similar tactics as mentioned in the DREAMS model. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	-	5	686	8,331	25,974	58,500	78,000	58,500	78,000	130,500	174,000	247,500	330,000	Zero-Based
24		Gas Infrastructure Protection Plan (GIPP)	GIPP keeps Company assets, commercial buildings, and residential buildings safe from impact damages of distribution gas equipment. This is done by installing protective infrastructure in strategic locations. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	435	2,583	6,288	5,714	5,228	8,170	10,320	8,170	10,320	7,600	9,600	23,940	30,240	Zero-Based
25		Anodeless Riser Project/Distribution Riser Integrity Program (DRIP)	The program addresses corrosion, damage, leaks, and improper installation by a third party and promotes remediation full replacement or the installation of a protective coating to eliminate riser damage. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	-	-	-	-	1,334	-	-	-	-	-	-	-	-	-
26		Sewer Lateral Inspection Program (SLIP)	Address a rare but potentially serious case where gas pipelines installed using trenchless technology penetrate sewer laterals in residential areas. State of the art technology is used to locate and replace areas that have been affected. This program is part of DIMP, which is by CFR 49 Part 192 Subpart P.	B/P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Gas Distribution Pipeline Integrity Management Subtotal				58,637	41,663	52,433	43,575	60,093	95,170	124,320	95,170	124,320	166,600	219,600	356,940	468,240	
28	TOTAL				\$ 65,551	\$ 45,164	\$ 57,658	\$ 49,404	\$ 65,847	\$ 100,655	\$ 131,249	\$ 101,797	\$ 132,690	\$ 173,919	\$ 228,845	\$ 376,371	\$ 492,785	

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