



Order Instituting Investigation into the November) Investigation 19-11-011
2019 Submission of San Diego Gas & Electric)
Company's Risk Assessment and Mitigation Phase.)

RISK ASSESSMENT MITIGATION PHASE

WORKPAPERS TO

CHAPTER SDG&E-2

CONTRACTOR SAFETY

November 27, 2019

Model Inputs

Incident Rates

Injury	0.710
Fatality	0.442
	1.152

Sector	Injury Incident Rate	Sector	Fatality Incident Rate
23	0.515754903	23	0.276052769
81	0.003668398	81	0.004818692
33	0.046144769	33	0.006206042
56	0.029729098	56	0.023880818
54	0.022385634	54	0.01267291
53	0.000762129	53	0.000745465
42	0.007072971	42	0.003074527
21	0.018328605	21	0.007572139
48	0.014795293	48	0.015152004
11	0.02012182	11	0.082969427
32	0.005273314	32	0.000709212
22	0.025988097	22	0.007520578
72	4.89847E-05	72	4.2068E-05
61	3.53748E-05	61	8.04829E-05
51	0.000138699	51	5.32521E-05
62	8.69908E-05	62	2.45281E-05
	0.71033508		0.441574913

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| List of NAICS Sectors included in model |
| 11-Agriculture, Forestry, Fishing and Hunting |
| 21-Mining, Quarrying, and Oil and Gas Extraction |
| 22-Utilities |
| 23-Construction |
| 32-Manufacturing |
| 33-Manufacturing |
| 42-Wholesale Trade |
| 48-Transportation and Warehousing |
| 51-Information |
| 53-Real Estate and Rental and Leasing |
| 54-Professional, Scientific, and Technical Services |
| 56-Administrative and Support and Waste Management and Remediation Services |
| 61-Educational Services |
| 62-Health Care and Social Assistance |
| 72-Accommodation and Food Services |
| 81-Other Services (except Public Administration) |

Chapter	SDG&E-2
Risk	Contractor Safety

Single Point

ID	Activity	Project Life	Cost Forecast (O&M, \$M)	Cost Forecast (Capital, \$M)			Pre-Mitigation		% risk reduction (use if % risk addressed not available) (%)	RSE	Post-Mitigation	
							Single Point				Single Point	
		In Years	2022	2020	2021	2022	LORE	CORE	Single Point	LORE	CORE	
SDG&E-2-C1	Contractor Oversight Program (Company inspectors/project managers oversee and inspect contractor field work, Job Safety Analysis)	1	0.89	2.90	2.90	2.90	1.15	1,222.56	16.0%	56.13	1.34	1,222.56
SDG&E-2-C3	Third party administration programs(SNetWorld) and tools	1	0.02	0.00	0.00	0.00	1.15	1,222.56	0.3%	196.72	1.16	1,222.56
SDG&E-2-C6	Contractor Safety Summit and Quarterly Safety Meetings	1	0.01	0.00	0.00	0.00	1.15	1,222.56	0.3%	356.94	1.16	1,222.56
SDG&E-2-M1	Expanded Contractor Oversight Program (Additional FTEs, enhance reporting software)	1	0.24	1.20	1.20	1.20	1.15	1,222.56	2.0%	18.44	1.13	1,222.56
SDG&E-2-M3	Near Miss/Close Call reporting portal/app. All contractor safety data from ISN and predictive solutions rolled up into realtime dashboard	1	0.10	0.00	0.00	0.00	1.15	1,222.56	0.3%	44.26	1.15	1,222.56
SDG&E-2-A1	Develop an all internal program to pre-qualify an oversee contractor safety (10 FTE equivalent)	1	1.39	0.00	0.00	0.00	1.15	1,222.56	0.2%	1.62	1.15	1,222.56
SDG&E-2-A2	Use alternative third-party administrator to pre-qualify contractors	1	0.03	0.00	0.00	0.00	1.15	1,222.56	0.3%	139.11	1.15	1,222.56

Low Alternative

ID	Activity	Project Life	Cost Forecast (O&M, \$M)	Cost Forecast (Capital, \$M)			Pre-Mitigation		% risk reduction (use if % risk addressed not available) (%)	RSE	Post-Mitigation	
							Low Alternative				Low Alternative	
		In Years	2022	2020	2021	2022	LORE	CORE	Low Alternative	LORE	CORE	
SDG&E-2-C1	Contractor Oversight Program (Company inspectors/project managers oversee and inspect contractor field work, Job Safety Analysis)	1	0.89	2.90	2.90	2.90	1.15	200.39	16.0%	9.20	1.34	200.39
SDG&E-2-C3	Third party administration programs(SNetWorld) and tools	1	0.02	0.00	0.00	0.00	1.15	200.39	0.3%	32.24	1.16	200.39
SDG&E-2-C6	Contractor Safety Summit and Quarterly Safety Meetings	1	0.01	0.00	0.00	0.00	1.15	200.39	0.3%	58.51	1.16	200.39
SDG&E-2-M1	Expanded Contractor Oversight Program (Additional FTEs, enhance reporting software)	1	0.24	1.20	1.20	1.20	1.15	200.39	2.0%	3.02	1.13	200.39
SDG&E-2-M3	Near Miss/Close Call reporting portal/app. All contractor safety data from ISN and predictive solutions rolled up into realtime dashboard	1	0.10	0.00	0.00	0.00	1.15	200.39	0.3%	7.25	1.15	200.39
SDG&E-2-A1	Develop an all internal program to pre-qualify an oversee contractor safety (10 FTE equivalent)	1	1.39	0.00	0.00	0.00	1.15	200.39	0.2%	0.27	1.15	200.39
SDG&E-2-A2	Use alternative third-party administrator to pre-qualify contractors	1	0.03	0.00	0.00	0.00	1.15	200.39	0.3%	22.80	1.15	200.39

High Alternative

ID	Activity	Project Life	Cost Forecast (O&M, \$M)	Cost Forecast (Capital, \$M)			Pre-Mitigation		% risk reduction (use if % risk addressed not available) (%)	RSE	Post-Mitigation	
							High Alternative				High Alternative	
		In Years	2022	2020	2021	2022	LORE	CORE	High Alternative	LORE	CORE	
SDG&E-2-C1	Contractor Oversight Program (Company inspectors/project managers oversee and inspect contractor field work, Job Safety Analysis)	1	0.89	2.90	2.90	2.90	1.15	2926.19	16.0%	134.34	1.34	2926.19
SDG&E-2-C3	Third party administration programs(SNetWorld) and tools	1	0.02	0.00	0.00	0.00	1.15	2926.19	0.3%	470.84	1.16	2926.19
SDG&E-2-C6	Contractor Safety Summit and Quarterly Safety Meetings	1	0.01	0.00	0.00	0.00	1.15	2926.19	0.3%	854.34	1.16	2926.19
SDG&E-2-M1	Expanded Contractor Oversight Program (Additional FTEs, enhance reporting software)	1	0.24	1.20	1.20	1.20	1.15	2926.19	2.0%	44.12	1.13	2926.19
SDG&E-2-M3	Near Miss/Close Call reporting portal/app. All contractor safety data from ISN and predictive solutions rolled up into realtime dashboard	1	0.10	0.00	0.00	0.00	1.15	2926.19	0.3%	105.94	1.15	2926.19
SDG&E-2-A1	Develop an all internal program to pre-qualify an oversee contractor safety (10 FTE equivalent)	1	1.39	0.00	0.00	0.00	1.15	2926.19	0.2%	3.88	1.15	2926.19
SDG&E-2-A2	Use alternative third-party administrator to pre-qualify contractors	1	0.03	0.00	0.00	0.00	1.15	2926.19	0.3%	332.95	1.15	2926.19

SDG&E-2-C1: Contractor Oversight Program (Company inspectors/project managers oversee and inspect contractor field work, Job Safety Analysis)

Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	16%	<i>SME Estimate based on year-over-year reduction in OSHA recordable rate.</i>	SME Estimate	SME Estimate	SME Estimate	OSHA Recordables	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.34		
	CoRE	200.39	1222.56	2926.19
	Risk Score	267.76	1633.61	3910.02
	RSE	9.20	56.13	134.34

SDG&E-2-C3: Third party administration programs(ISNetWorld) and tools							
Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	0.33%	<i>SME Estimate based on year-over-year reduction in safety incidents</i>	SME Estimate	SME Estimate	SME Estimate	Historical safety incidents	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.16		
	CoRE	200.39	1222.56	2926.19
	Risk Score	231.60	1412.98	3381.94
	RSE	32.24	196.72	470.84

SDG&E-2-C6: Contractor Safety Summit and Quarterly Safety Meetings							
Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	0.33%	<i>SME Estimate based on year-over-year reduction in safety incidents</i>	SME Estimate	SME Estimate	SME Estimate	Historical safety incidents	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.16		
	CoRE	200.39	1222.56	2926.19
	Risk Score	231.60	1412.98	3381.94
	RSE	58.51	356.94	854.34

SDG&E-2-M1: Expanded Contractor Oversight Program (Additional FTEs, enhance reporting software)							
Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	2%	<i>SME Estimate based on approximate 16% decrease in OSHA recordables.</i>	SME Estimate	SME Estimate	SME Estimate	OSHA Recordables	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.13		
	CoRE	200.39	1222.56	2926.19
	Risk Score	226.21	1380.12	3303.29
	RSE	3.02	18.44	44.12

SDG&E-2-M3: Near Miss/Close Call reporting portal/app. All contractor safety data from ISN and predictive solutions rolled up into realtime dashboard

Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	0.33%	<i>SME estimate based on expected increase in enhanced safety awareness from reported Near Miss/Close Call incidents.</i>	SME Estimate	SME Estimate	SME Estimate	OSHA Recordables	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.06	1403.59	3359.47
	RSE	7.25	44.26	105.94

SDG&E-2-A1: Develop an all internal program to pre-qualify an oversee contractor safety (10 FTE equivalent)							
Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	0.17%	SME estimate based on SDG&E's internal resources compared to third-party administration.	SME Estimate	SME Estimate	SME Estimate	SME Estimate	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.44	1405.89	3364.98
	RSE	0.27	1.62	3.88

SDG&E-2-A2: Use alternative third-party administrator to pre-qualify contractors							
Attribute	Risk Reduction	Formula	RSE Inputs and Basis			Reference	Project Life (Years)
	Total		Scope	Effectiveness	Risk Addressed		
Safety	0.33%	<i>SME estimate based on SDG&E's internal resources compared to third-party administration.</i>	SME Estimate	SME Estimate	SME Estimate	SME Estimate	1
Reliability							
Financial							

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE	1.15		
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.06	1403.59	3359.47
	RSE	22.80	139.11	332.95