

THE UTILITY REFORM NETWORK DATA REQUEST
TURN-DR-010
SDG&E/SOCALGAS 2021 RAMP REPORTS- A.21-05-011/014
DATE RECEIVED: AUGUST 13, 2021
DATE RESPONDED: AUGUST 27, 2021

Question 1:

The following questions refer to the spreadsheet “Final 2021 RSE Workpaper – SCG MP – Supplemental Level 2.xls.”

- a. In the worksheet tab “Risk Scoring Workpaper,” please explain what the “after meter incident rate” represents and provide the source data for the value of 0.1429.
- b. Please explain how SCG calculated the “population density adjustment” value of 1.4556.
- c. In the worksheet “RSE Workpaper,” provide the calculations on which the “% Risk Addressed,” “% Mitigation Scope,” and “% Effectiveness” values are based and the sources of all inputs to those calculations.
- d. Please explain how “% Effectiveness” values for multiple mitigations can be greater than 100%.
- e. Please explain how SCG calculated a lifetime benefit of 3.392115417 years for the mitigation “Leak Survey and Main & Service Leak Repair,” as this appears to be a “pasted” value based on a separate calculation. Please provide the sources for all inputs to the calculation.
- f. In the worksheet “RSE Summary,” please provide all calculations to derive the values and the sources of all inputs for the Post-Mitigation LoRE values shown in column M.

SDG&E/SoCalGas Response 01:

- a. “After meter incident rate” refers to the incident rate determined for incidents occurring beyond the company owned meter set assembly (MSA). This includes any incidents on customer owned assets such as the yard line, appliances, etc. The source is internal data.
- b. The population density factor is designed to more accurately represent the safety impacts of an incident occurring in SoCalGas’s territory. As reflected in the workpaper, 26 hazardous incidents occurred in SoCalGas’s territory from 2010-2019, with 6 of these incidents resulting in a serious injury or fatality.¹ The utilities applied a population density factor to counteract the statistically minimal SoCalGas and SDG&E data. The factor was determined:
 - a. Using all Medium Pressure (MP) hazardous incidents in the nation, the serious injury and fatalities (SIFs) were scaled up or down using the ratio of the average population density of SoCalGas (or SDG&E) to the population density where the incident occurred to estimate the safety consequence had the incident occurred in the SoCalGas (or SDG&E) territory.

¹ See Tab “Risk Scoring Workpaper” in the workpaper referenced in this question.

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SDG&E/SoCalGas Response 01: CONTINUED

- b. The scaled SIFs were then averaged and the percentage of national hazardous incidents that resulted in a SIF was determined as well as the average SIF impact of said incidents.
- c. The multiplier was then determined by taking the ratio between the average scaled SIFs and the national SIFs over the percentage of incidents at the national level; 1.46 for SoCalGas and 1.83 for SDG&E.
- c. Refer to SDG&E/SoCalGas Response 02 of TURN-DR-08.
- d. Refer to SDG&E/SoCalGas Response 03 of TURN-DR-08.
- e. The benefit lifetime for the control of “Leak Survey and Main & Service Leak Repair,” was determined dividing the total miles of pipe in the system to be surveyed (101,102 miles) by the miles pipe that are surveyed per year (29,805 miles). The resulting value of 3.9 effectively represents the period of time between surveys on any given segment of main or service pipe.
- f. The Post-Mitigation LoRE is determined by multiplying the Pre-Mitigation LoRE by the % Risk Addressed, % Mitigation Scope, and % Effectiveness and taking the difference thereof. In other words:
*Post – Mitigation LoRE = Pre – Mitigation LoRE (1 – % Risk Addressed * % Mitigation Scope * % Effectiveness)*

All data and sources can be viewed in each chapter’s respective workpaper as well in SDG&E/SoCalGas Response 02 of TURN-DR-08.

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Question 2:

The following questions refer to the spreadsheet “Final 2021 RSE Workpaper – SCG HP – Supplemental Level 2.xls.”

- a. In the worksheet “Risk Scoring Workpaper,” what is the basis for the “SoCalGas HCA Adjustment value of 1.439? Please show how this value was calculated and the source of all inputs to the calculation.
- b. SCG cites PHMSA data showing a total of 16 incidents with fatalities and/or injuries over the 10-year period, 2010-2019. Please confirm that in these 16 incidents there were a total of 15 fatalities, which is the basis for the 0.9375 fatalities per incident value. If that is not the basis for the per-incident value, please explain the calculation of the 0.9375 value and provide the source of all inputs to the calculation.
- c. Please confirm that these 16 incidents accounted for 76 total injuries and that this value is the basis for the SCG injury rate of 4.75 per incident. If that is not the basis for the per-incident value, please explain the calculation of the 4.75 value and provide the source of all inputs to the calculation.
- d. State whether the PHMSA data for 2010-2019 reported 5 fatalities and 47 injuries over the period 2010-2019 associated with supply line events. If not, please provide explain the calculation of 0.167 fatalities/incident and 1.5667 injuries/incident for supply line events with a safety consequence and provide the source of the inputs to the calculations.
- e. Please explain how the \$11.133 million and \$6.348 million financial consequence values for high consequence transmission and supply line events, respectively, were calculated and provide the source of the inputs to the calculations.
- f. Please explain how the assumed 125 MMcf/day gas curtailment value per incident value relates to the 250 MMcf/day minimum threshold value reported in its RAMP report at page C-16. Please explain how the 125 MMcf/day value was calculated and provide the source of the inputs to the calculations.
- g. Provide the basis for the Stakeholder Satisfaction values shown, including any calculations on which those values are based.
- h. Does SCG’s analysis assume that the likelihood and consequences of any event involving pipe are identical for HP pipelines and for non-pipeline facilities in the HP system, including compressor stations and regulator stations? Why or why not? Please show how this answer is reflected in the workpapers.
- i. Does SCG believe that the likelihood and consequences of any event involving pipe are identical for HP pipelines and for non-pipeline facilities in the HP system, including compressor stations and regulator stations? Why or why not?
- j. Please indicate whether 2010-2019 PHMSA data differentiates between HP pipe related events and events related to other facilities in the HP system, such as compressor-related events and regulator station-related events. Please provide a link to any PHMSA data for that period that is so differentiated.

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Question 2:-CONTINUED

- k. In the worksheet “RSE Summary,” please provide all calculations to derive the values and the sources of all inputs for the Post-Mitigation LoRE values shown in column M.
- l. In the worksheet “RSE Workpaper,” provide the calculations on which the “% Risk Addressed,” “% Mitigation Scope,” and “% Effectiveness” values are based and the sources of all inputs to those calculations.
- m. Please explain how “% Effectiveness” values for multiple mitigations can be greater than 100%.
- n. Please explain how the assumed lifetime benefit of 24.4 years for mitigations MO1-TO1 and MO1-TO2 were calculated and provide the source for all inputs.

SDG&E/SoCalGas Response 02:

- a. As stated in the August 11, 2021, workshop, the high pressure (HP) risk score is determined at the system level which means pipeline encompassed in the scope of the risk is pipeline that both runs through High Consequence Areas (HCA) and Non-High Consequence Areas (Non-HCA). In order to capture this nuance, SDG&E and SoCalGas took measures to adequately quantify the impacts of operating in HCAs by adjusting the safety consequence in the High Pressure Incident Risk. The multiplying factor is used to account for differences in the proportion of HCA and non-HCA mileage in SoCalGas (or SDG&E) compared to national and was determined as follows:
 - a. Calculating the SIF per incident per mile rate for both HCA and Non-HCA on a national level.
 - b. The rates mentioned above are converted into SIF per incident rates by applying SoCalGas’s (or SDG&E’s) total mileage, multiplied by the proportion of HCA. and non-HCA miles nationally. The total SIF per incident rate is the sum of the HCA and Non-HCA SIF per incident rates. This calculation reflects the national SIF data, assuming the utility’s total mileage but that the proportions of HCA and non-HCA mileage followed the respective national values.
 - c. Subsequently, the SIF per incident rate is calculated more directly using similar methodology as described previously by using SoCalGas’s (or SDG&E’s) actual proportions of HCA and non-HCA miles.
 - d. The ratio of the rate described in c to the rate described in b, resulted in the 1.44 adjustment. This adjustment is meant to capture the higher proportion of HCA miles in SoCalGas’s system compared to the overall proportion nationally.
 - i. The same analysis was done for SDG&E resulting in an adjustment of 2.30. A higher factor is used for SDG&E to account for the higher percentage of HCA miles in their system compared to SoCalGas.

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SDG&E/SoCalGas Response 02: CONTINUED

- b. SDG&E and SoCalGas confirm per PHMSA data that nationwide, 15 total fatalities occurred over 16 total Transmission incidents, with a safety impact, over ten years (2010 – 2019). This is the basis for the calculation is 15 out of 16 (0.9375).
- c. SDG&E and SoCalGas confirm per PHMSA data that nationwide, 76 total injuries occurred over 16 total Transmission incidents, with a safety impact, over ten years (2010 – 2019). This is the basis for the calculation 76 out of 16 (4.75).
- d. SDG&E and SoCalGas confirm per PHMSA data that nationwide, 5 total fatalities occurred over 30 Supply Line incidents, with a safety impact, over ten years (2010 – 2019). This is the basis for the calculation 5 out of 30 (0.1667). SDG&E and SoCalGas confirm per PHMSA data nationwide, 47 total injuries occurred over 30 Supply Line incidents, with a safety impact, over ten years (2010 – 2019). This is the basis for the calculation 47 out of 30 (1.567).
- e. The financial impact was determined by looking at the San Bruno Case Study, which serves as an historical precedent for expected impacts for a high-pressure pipeline rupture incident in a populated area. According to the study, the societal impact due to San Bruno was determined to be \$452,863,000. Additionally, the SIF impact due to San Bruno was determined to be 20.75. With this information, the societal cost per SIF could be determined and thus the expected societal financial impact due to a Transmission or Supply Line event can be calculated as:

Societal Financial Impact

$$= \text{Societal Cost per SIF}_{\text{San Bruno}} * \text{Expected SIF}_{\text{Transmission or SL}} \\ + \text{Baseline Incident Cost}_{\text{Transmission or SL}}$$

- f. The referenced 125 MMcf is a curtailment sub-attribute and represents the curtailment volume above a 250 MMcf threshold. The value is based on SME input.

For SoCalGas, the 666 MMcf, shown in RAMP-C Table 9, is used to scale the gas curtailment volume and is also net of the 250 MMcf threshold. As stated in RAMP-C, “The Companies strive to prevent all curtailments, especially those that require curtailing over 250 MMcfd at SoCalGas or 80 MMcfd at SDG&E”. As mentioned in the August 11, 2021 workshop, SoCalGas’s SMEs identified a total curtailment volume of 250 MMcf as the likely curtailment volume that the gas system could experience without having a decrease in reliability. Note that this does not mean the gas system can always and in every location handle a 250 MMcfd outage but rather, in general and without other outages, the system could maintain gas service with a 250 MMcfd curtailment.

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SDG&E/SoCalGas Response 02: CONTINUED

The 125 MMcfd curtailment value represents a 50% increase to the above discussed 250 MMcf, resulting in a total curtailment of 375 MMcfd.

The 50% multiplier to the 250 MMcf value was determined through SME interpretations of historical internal incidents² as well as considering the capacity of critical lines that could be curtailed. The analysis also used an SME input-based assumption regarding the likelihood of a line being “back-fed,” in which case there is an incident but a line is able to be back-fed and preclude being curtailed.

- g. Stakeholder Satisfaction values were determined exclusively by SME input. The values were determined through a matrix approach wherein impact values are assessed between one and twenty for each defined stakeholder group of: Customer, Employee, Public, Government and Regulators. Values of 1, 2, 5, 10 and 20 are defined within each stakeholder group and then converted through the Multi-Attribute Value Function (MAVF). Below is a table representing the scoring methodology of the attribute:

Stakeholder	Definition	Scoring Guidelines				
		1	2	5	10	20
Customer	Impact on total customer satisfaction from a risk event	Mild and temporary dissatisfaction to some customers	Mild and temporary dissatisfaction across many customers	Moderate and temporary dissatisfaction across many customers	Moderate and sustained dissatisfaction across many customers	Extreme and sustained dissatisfaction across entire customer base
Employee	Impact on total employee satisfaction from a risk event	Mild and temporary dissatisfaction to some employees	Mild and temporary dissatisfaction across many employees	Moderate and temporary dissatisfaction across many employees	Moderate and sustained dissatisfaction across many employees	Extreme and sustained dissatisfaction across entire employee base; mass exodus of employees
Public	Reach and duration of negative media response to risk event	Temporary local news	Sustained local news, temporary state news	Sustained state news, temporary national news	Sustained national news, temporary international news	Sustained international news
Government	Increased number of audits that occur post risk event by non-regulatory government entities (e.g. local / state governments)	Statement made acknowledging the event; no audit or investigation	Event specific audit	Multiple audits and some discussion/proposals of new regulations	Multiple investigations and new regulations passed requiring some change to utility operations	Multiple investigations and new regulations passed requiring significant change to utility operations
Regulators	Increased number of audits that occur	Statement made acknowledging the event; no	Event specific audit	Multiple audits and some discussion/prop	Multiple investigations and new	Multiple investigations and new

² Note that the workpaper incorrectly identifies PHMSA as the source of this information.

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	post risk event by regulatory entities	audit or investigation		osals of new regulations	regulations passed requiring some change to utility operations	regulations passed requiring significant change to utility operations
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- h. The High Pressure risk chapters are scoped at the system level meaning that all assets that operate at high pressure (greater than 60 psig) are captured in the risk score. The score is representative of all assets in the high pressure system. As can be seen when reviewing the “Risk Scoring Workpaper” in SCG-RISK-1-WP & SDG&E-RISK-3-WP, compressors, odorizers, and pipelines are included in the likelihood calculation. Regarding the PHMSA incident data, incidents beyond line pipe, i.e. valves, compressors, regulators, etc. were included in the determination of likelihood and consequence.
- i. SDG&E and SoCalGas recognize incidents involving different assets may have different likelihoods and consequences. The utilities’ approach in the 2021 RAMP considers the risk to occur at the system level. Please refer to response h above.
- j. PHMSA incident reporting does differentiate between the type of asset or assets involved, as noted in “SYSTEM_PART_INVOLVED” of the incident reporting extract. PHMSA incident reporting is located at the following web address (please note that the PHMSA data today may contain data not captured in SoCalGas and SDG&E’s 2021 RAMP filing because additional data may have become available since the time SoCalGas and SDG&E prepared their quantitative analysis):
<https://www.phmsa.dot.gov/data-and-statistics/pipeline/distribution-transmission-gathering-lng-and-liquid-accident-and-incident-data>
- k. Refer to subpart f of SDG&E/SoCalGas Response 01.
- l. Refer to SDG&E/SoCalGas Response 02 of TURN-DR-08.
- m. Refer to SDG&E/SoCalGas Response 03 of TURN-DR-08.
- n. SMEs estimate that 70% of the time hydrotesting will be conducted (which has a benefits lifetime of 7 years based on typical inspection cycle) and 30% of the time pipe will need to be replaced (which has an average accounting service life of 65 years). A weighted average of these options renders a benefits lifetime of 24.4 years.

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Question 3 :

The following questions refer to the spreadsheet “Final 2021 RSE Workpaper – SCG Stor – Supplemental Level 2.xls.”

- a. Please state the number of storage wells currently operated by SCG. Please indicate any variation in this number over the 28 years used for the “Risk Scoring Workpaper” worksheet.
- b. In the “Risk Scoring Workpaper” worksheet, SCG reports a total of 5 medium consequence well incidents over 28 years, and uses these values to determine a value for “incident per well per year.” Does this value reflect the number of wells operated by SCG over this time period? Please explain your answer.
- c. In the “Risk Scoring Workpaper” worksheet, please explain how the value of 0.0833 high consequence total incidents per year was calculated and provide the basis of all SME inputs for the calculation.
- d. Provide the raw PHMSA data used to determine the 138.75 MMcf/day gas curtailment value high consequence event and explain the calculation to derive this value.
- e. Please explain how the assumed 138.75 MMcf/day gas curtailment value per incident value relates to the 250 MMcf/day minimum threshold value reported in its RAMP report at page C-16.
- f. Provide the internal data for the high consequence gas meter value of 36,200 and the medium consequence value of 16,033 meters.
- g. Provide the basis for the SME input that determined financial costs of \$36,700,000 and \$291,125,000 to make company assets operational after Medium and High Consequence Storage events, respectively? How did the SMEs calculate these precise values?
- h. In the worksheet “RSE Summary,” please provide all calculations to derive the values and the sources of all inputs for the Post-Mitigation LoRE values shown in column M.
- i. In the worksheet “RSE Workpaper,” provide the calculations on which the “% Risk Addressed,” “% Mitigation Scope,” and “% Effectiveness” values are based and the sources of all inputs to those calculations.
- j. Please explain how the “% Mitigation Scope” value for the “Upgrade to Purification Equipment” mitigation is 200%.

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SDG&E/SoCalGas Response 03:

- a. SoCalGas/SDG&E objects to this request to the extent it seeks information that may be outside the scope of this proceeding. Subject to and without waiving the foregoing objection, SDG&E/SoCalGas responds as follows: SoCalGas currently operates 119 underground gas storage wells.

- b. The 5 historical incidents are compared to the total number of wells currently being operated by SoCalGas, not the number of wells previously in operation. As stated in the August 11 2021 workshop, risk scores serve as a snapshot in time of current risk levels. SoCalGas believes the total number of wells (regardless of operation status) relative to what is currently in operation does not impact the historical number of incidents that occurred nor the consequence.

- c. The 0.0833 represents the totality of all events (small to large) that have occurred at SoCalGas over the last 70 years, i.e., 6 events over approximately 70 years, to get a value of approximately 1-in-12 years.

- d. Annual withdrawal can be found on the following PHMSA website:
https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/data_statistics/pipeline/annual_underground_natural_gas_storage_2017_present.zip

The curtailment impact for the Storage Risk was derived utilizing 2019 historical withdrawal for all of SoCalGas's storage fields. If an incident were to occur where one or multiple storage fields were taken out of service, the utility would lose its ability to balance the natural gas system with the withdrawal from the fields. Assuming a range of possible number of days (0-60 days based on SME) the fields would be impacted resulted in a range of capacity lost wherein an expected value could be determined.

- e. Refer to subpart f of SDG&E/SoCalGas Response 02.

- f. The expected curtailment impact for a Storage incident was determined through SME interpretations of historical internal incidents as well as capacity critical lines and fields and their loss thereof.

- g. As was presented in SoCalGas's 2019 RAMP Report, specifically the workpapers to Chapter SCG-8: Storage Well Integrity Event,³ the average cost of historical events can

³ <https://www.socalgas.com/regulatory/documents/i19-11-010/SCG-8%20Storage%20Well%20Integrity%20Event%20Workpaper.pdf>.

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SDG&E/SoCalGas Response 03: CONTINUED

be determined to be \$36.7 million. When factoring in the Aliso Canyon incident, the average becomes \$291.125 million.

- h. Refer to subpart f of SDG&E/SoCalGas Response 01.
- i. Refer to SDG&E/SoCalGas Response 02 of TURN-DR-08
- j. The “Upgrade to Purification Equipment” activity represents capital work at each of the four storage fields operated by SoCalGas, specifically work within tank farms and dehydration units. Because the tank farms and dehydration units are each comprised of many different asset types (vessels, valves, piping, heaters, heat exchangers, pumps, etc.), no single unit of work could be determined; therefore, the scope was examined one order of magnitude greater at the unit/farm level. There are 12 purification stations across the four fields and on average SoCalGas annually performs projects involving 8 different stations. The 200% scope value represents completing multiple projects within the 12 stations over a three year cycle. This activity is considered on-going capital work to maintain the major equipment associated with natural gas dehydration.

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Question 4:

Describe the process by which SCG SMEs determined the “Stakeholder Satisfaction” attribute levels for HP, MP, and Storage events. For example, please explain why the “Government” and “Regulator” group are assigned values of 4 and 7, respectively, for a high consequence HP pipe event, whereas the Government and Regulator groups are each assigned values of 8 for a high consequence Storage incident. Explain why the Public and Customer values are set to 1 for this same Storage event.

SDG&E/SoCalGas Response 04:

As mentioned in the reply to subpart g of SDG&E/SoCalGas Response 02, impact scores in the workpapers are developed using SME input based on their review and consideration of historical and potential future incidents that may occur within the MP, HP and Storage systems. SMEs weigh the impacts of past risk events as well as the reasonable worst-case scenario to determine an expected impact value.

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Question 5:

State whether the SMEs assign stakeholder satisfaction values that are correlated with the Safety, Financial, and Reliability attribute levels for high consequence events. If the answer is “yes,” please explain how the SMEs determined the correlations.

SDG&E/SoCalGas Response 05:

Refer to subpart g of SDG&E/SoCalGas Response 02 and SDG&E/SoCalGas Response 04.