

**SAN DIEGO GAS & ELECTRIC COMPANY
SOUTHERN CALIFORNIA GAS COMPANY
PIPELINE SAFETY & RELIABILITY PROJECT (PSRP)
(A.15-09-013)
(DATA REQUEST ORA-36)**

**Date Requested: August 25, 2016
Date Responded: September 14, 2016**

PRELIMINARY STATEMENT

1. These responses and objections are made without prejudice to, and are not a waiver of, SDG&E and SoCalGas' right to rely on other facts or documents in these proceedings.
2. By making the accompanying responses and objections to these requests for data, SDG&E and SoCalGas does not waive, and hereby expressly reserves, its right to assert any and all objections as to the admissibility of such responses into evidence in this action, or in any other proceedings, on any and all grounds including, but not limited to, competency, relevancy, materiality, and privilege. Further, SDG&E and SoCalGas makes the responses and objections herein without in any way implying that it considers the requests, and responses to the requests, to be relevant or material to the subject matter of this action.
3. SDG&E and SoCalGas will produce responses only to the extent that such response is based upon personal knowledge or documents in the possession, custody, or control of SDG&E and SoCalGas. SDG&E and SoCalGas possession, custody, or control does not include any constructive possession that may be conferred by SDG&E or SoCalGas' right or power to compel the production of documents or information from third parties or to request their production from other divisions of the Commission.
4. A response stating an objection shall not be deemed or construed that there are, in fact, responsive information or documents which may be applicable to the data request, or that SDG&E and SoCalGas acquiesces in the characterization of the premise, conduct or activities contained in the data request, or definitions and/or instructions applicable to the data request.
5. SDG&E and SoCalGas objects to the production of documents or information protected by the attorney-client communication privilege or the attorney work product doctrine.
6. SDG&E and SoCalGas expressly reserve the right to supplement, clarify, revise, or correct any or all of the responses and objections herein, and to assert additional objections or privileges, in one or more subsequent supplemental response(s).
7. SDG&E and SoCalGas will make available for inspection at their offices any responsive documents. Alternatively, SDG&E and SoCalGas will produce copies of the documents. SDG&E and SoCalGas will Bates-number such documents only if SDG&E and SoCalGas deem it necessary to ensure proper identification of the source of such documents.
8. Publicly available information and documents including, but not limited to, newspaper clippings, court papers, and materials available on the Internet, will not be produced.

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9. SDG&E and SoCalGas object to any assertion that the data requests are continuing in nature and will respond only upon the information and documents available after a reasonably diligent search on the date of its responses. However, SDG&E and SoCalGas will supplement its answers to include information acquired after serving its responses to the Data Requests if it obtains information upon the basis of which it learns that its response was incorrect or incomplete when made.
10. In accordance with the CPUC's Discovery: Custom And Practice Guidelines, SDG&E and SoCalGas will endeavor to respond to ORA's data requests by the identified response date or within 10 business days. If it cannot do so, it will so inform ORA.
11. SDG&E and SoCalGas object to any ORA contact of SDG&E and SoCalGas officers or employees, who are represented by counsel. ORA may seek to contact such persons only through counsel.
12. SDG&E and SoCalGas objects to ORA's instruction to send copies of responses to entities other than ORA.

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Subject: Safety & Cost Effectiveness Analysis / Prepared Testimony of T. Sera

QUESTION 1:

Did SoCalGas/SDG&E consider the impact radius and number of households within the impact radius when determining the safety scores for their Proposed Project and the Alternative Project proposals (Items 1.1, 1.2, and 1.3 at p. 36 of the CEA)? Please provide a yes or no in response, and then explain if necessary.

RESPONSE 1:

Yes.

SDG&E and SoCalGas (Applicants) considered the potential impact radius and number of households and other structures within the potential impact radius when determining the safety scores for items 1.1, 1.2 and 1.3 for the Proposed Project and the Alternatives. The impact radius was considered insofar as it is related to and affected by:

- The increased safety margin to prevent pipeline rupture through de-rating of Line 1600 (item 1.1); and
- The presence of known pipeline anomalies and future resiliency and strength of design (item 1.2).

Additionally, impact radius and number of structures within the impact radius is a key consideration underlying the reduction in incidents per HCA (high-consequence area) mile of pipeline (item 1.3).

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Date Requested: August 25, 2016
Date Responded: September 14, 2016
Amended Response Submitted: July 12, 2017

The response to Question 2 has been amended, the changes are noted in red, bold and underline. Deletions are in ~~bold and strikethrough~~.

QUESTION 2:

How many structures are within the potential impact radius of Line 1600 at its current Maximum Allowable Operating Pressure of 512 psig?

RESPONSE 2:

The current maximum allowable operating pressure (MAOP) of Line 1600 is 640 psig. As directed by Resolution SED-1, the maximum operating pressure (MOP) of Line 1600 is 512 psig. Structure count is based on MAOP, and as of September 2016, the structure count within the potential impact radius (PIR) of Line 1600 was 3,577.

As of September 2016, for a theoretical MAOP of 512 psig, there were ~~are currently~~ 3,245 structures within the ~~potential impact radius (PIR)~~ of Line 1600 ~~at its current maximum allowable operating pressure (MAOP) of 512 psig.~~

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Amended Response Submitted: July 12, 2017

The response to Question 3 has been amended, the changes are noted in **red, bold and underline**. Deletions are in ~~bold and strikethrough~~.

QUESTION 3:

In response to ORA DR-07, Question 7, SoCalGas/SDG&E have stated that at 640 psig, 3,585 structures are within the potential impact radius of Line 1600. Since giving this response, has this number changed? If so, please provide the new number and explain.

RESPONSE 3:

~~In response to Question 7(a) of ORA DR 7 on May 12, 2016, Applicants stated that at 640 psig, there are 3,585 structures within the PIR of Line 1600. Since providing this response, Applicants were ordered by the Commission to reduce the MAOP of Line 1600 from 640 psig to 512 psig. As such, the number of structures in the PIR has changed. Please see the response to Question 2 above.~~

~~However, Applicants note that if Line 1600 was operating at 640 psig there would be 3,577 structures in the PIR based upon Applicants' current dataset.~~ **Line 1600 has a MAOP of 640 psig.** Since providing the response to Question 7 of ORA DR 7, **the structures within the PIR changed from 3,585 to 3,577, as of September 2016.** †The structure count has been reduced by 8 based upon centerline changes from the incorporation of spatial data that was recently processed.

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RESPONSE 3:

In response to Question 7(a) of ORA DR 7 on May 12, 2016, Applicants stated that at 640 psig, there are 3,585 structures within the PIR of Line 1600. Since providing this response, Applicants were ordered by the Commission to reduce the MAOP of Line 1600 from 640 psig to 512 psig. As such, the number of structures in the PIR has changed. Please see the response to Question 2 above.

However, Applicants note that if Line 1600 was operating at 640 psig there would be 3,577 structures in the PIR based upon Applicants' current dataset. Since providing the response to Question 7 of ORA DR 7, the structure count has been reduced by 8 based upon centerline changes from the incorporation of spatial data that was recently processed.

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QUESTION 4:

In response to ORA DR-07, Question 7, SoCalGas/SDG&E have stated that at 320 psig, 2,689 structures would be within the potential impact radius of Line 1600. Since giving this response, has this number changed? If so, please provide the new number and explain.

RESPONSE 4:

Since providing the response to Question 7 of ORA DR 7, the structure count has been reduced by 1, due to centerline changes from the incorporation of spatial data that was recently processed. There are currently 2,688 structures.

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QUESTION 5:

In response to ORA DR-07, Question 7, SoCalGas/SDG&E have stated that at 800 psig and a diameter of 36", proposed line 3602 would have 7,362 structures within the potential impact radius of the line. Since giving this response, has this number changed? If so, please provide the new number and explain.

RESPONSE 5:

The number of structures provided in response to Question 7 of ORA DR 7 with respect to proposed Line 3602 has not changed.

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QUESTION 6:

With Line 1600 operating at a Maximum Allowable Operating Pressure of 320 psig, and Line 3602 installed and operational, please confirm that approximately 6,466 new structures (896 less structures in the potential impact radius of L1600 if derated, plus 7,362 new structures for L3602 if built as proposed by the Applicants) would be within the potential impact radius of these two pipelines.

RESPONSE 6:

Analysis of the number of structures affected by a de-rated Line 1600 operating at an MAOP of 320 psig was not contemplated as part of this Application. As noted in the CEA at page 62, footnote 122, Line 1600, once de-rated, will be a distribution line and therefore will not be subject to Subpart O and related TIMP regulations.

Notwithstanding, using the methodology prescribed in this question and updated responses provided in Question 3 and Question 4 above, the answer is 6,473 structures, assuming all conditions remain the same. Please note that these are not all “new” structures, as stated in Question 6. This number does not account for the structures that are in the area where Line 1600 and the proposed Line 3602 would intersect. Accounting for the intersecting areas, the structure count would be 6,315, assuming all conditions remain the same.

A de-rated Line 1600 will result in a significant increase in the safety margin of the pipeline, and a decrease in overall risk when considering the combined effect of operating L1600 at lower pressure and operating a newly constructed pipeline 3602 that features the benefits of state-of-the-art materials and modern design and construction methods.

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QUESTION 7:

If Line 3602 was built as a 16" pipeline, approximately how many structures would be within the potential impact radius of the pipeline?

RESPONSE 7:

Analysis of the number of structures affected by a newly constructed pipeline using a 16" diameter pipeline design was not contemplated as part of this Application. The Application proposes a de-rated Line 1600 that will result in a significant increase in the safety margin of the pipeline, and a decrease in overall risk when considering the combined effect of operating Line 1600 at a lower pressure and operating a newly constructed pipeline (Line 3602) that features the benefits of state-of-the-art materials and modern design and construction methods.

Notwithstanding, assuming a new 16" diameter pipeline was constructed and operated at 800 psig, there would be 2,980 structures within the PIR.

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QUESTION 8:

Are there any transmission lines within the SoCalGas or SDG&E systems for which SoCalGas or SDG&E have recommended a Transmission Integrity Management Plan (TIMP) reassessment interval of less than 7 years? Please explain and provide specific reference to which pipeline, and provide the TIMP assessment results that led to a lower reassessment interval.

RESPONSE 8:

Applicants object to this question on the grounds that it seeks information not relevant to any issue within the scope of this proceeding, which addresses Line 1600, compliance with Public Utilities Code § 958 and D.11-06-017, and whether the Proposed Project best serves the public convenience and necessity. TIMP results regarding other pipelines has no bearing on such issues. Applicants further object that gathering TIMP results for other pipelines is unduly burdensome, particularly given its irrelevance. Subject to and without waiving their objections, and not agreeing to provide TIMP assessment results for other pipelines, Applicants respond as follows.

Applicants strive to design, construct, operate and maintain transmission lines in a manner such that a 7 year reassessment period is appropriate in most cases, and lines with reassessment intervals of less than 7 years are scheduled in a manner consistent with Subpart O (see table below). In the case of Line 1600, on July 8, 2016, the Commission's Safety Enforcement Division ordered Applicants to perform In Line Inspections (ILI) of Line 1600 using identical technologies as in previous ILI runs and compare the results with the 2012-2015 ILI data. This will result in a reassessment period shorter than 7 years

Pipeline	Assessment Method	Reassessment Interval (years)
1204	Direct Assessment	4.3
235 WEST	Direct Assessment	5
37-18	Direct Assessment	5.7
4000	In-Line Inspection	5
45-120	Planned Replacement	N/A

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QUESTION 9:

If all other criteria in the CEA influencing safety scores are kept constant, does a pipeline that runs through uninhabited or low population locations (e.g. class 1 as defined by 49 CFR Section 192.5(b)) present a lower risk score in SoCalGas/SDG&E models than a pipeline running through inhabited or more densely populated locations (e.g. class 3 or 4 as defined by 49 CFR Section 192.5(b), or high consequence areas as defined by 49 CFR Section 192.903)? Are criteria such as number of class location or high consequence area included when scoring each of the alternatives for safety? Please explain your response.

RESPONSE 9:

The primary criteria when evaluating the Proposed Project and the Alternatives and determining the risk score was the modern design, construction and maintenance standards for the new pipelines that will meet or exceed all applicable federal and state safety regulations, rules, and requirements by complying with applicable SDG&E and SoCalGas Gas Standards (see the Prepared Direct Testimony of Deanna Haines, page 2, lines 3-5). While pipeline location is a consideration when evaluating and scoring risk, because it is not the primary consideration, it does not change the risk score in the CEA. Furthermore, Applicants will design and construct its new pipeline to the same high standards regardless of pipeline location.

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QUESTION 10:

Item 1.3 “Reduction in incidents per HCA mile of pipeline” (CEA, p. 36) states that it uses Pipeline Hazardous Safety Materials Administration data. Please provide that data, including the data in an Excel spreadsheet if available.

RESPONSE 10:

The data utilized in the analysis is publically available through the Pipeline Hazardous Materials and Safety Administration website at <http://www.phmsa.dot.gov/pipeline/library/data-stats/raw-data> (see CEA at page 58, footnote 110).

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QUESTION 11:

Does adding a gas transmission line to a gas system increase or decrease the likelihood of having an incident in a gas transmission system? Please explain your response.

RESPONSE 11:

It depends upon the full scope of the project. Determining the likelihood of an incident in a gas transmission system requires consideration of numerous factors. In the example of this Application, SDG&E and SoCalGas are proposing: (1) the installation of a new transmission pipeline manufactured and installed to meet, and in some instances exceed, applicable rules, laws, and regulations; and (2) the de-rating of an existing transmission pipeline that was installed in 1949 and has a known history of hook cracks and manufacturing anomalies. Thus, installation of the new, proposed Line 3602 and de-rating Line 1600 reduces the risk of a transmission incident relative to maintaining transmission operation of the existing Line 1600.

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QUESTION 12:

Does the CEA include the addition of a gas transmission line to a gas system as a criterion by which to score the safety of the alternatives?

RESPONSE 12:

Applicants object that this Question is vague and ambiguous—the CEA evaluates alternatives as required by the Joint Ruling, and such of the alternatives include construction of a new pipeline. To the extent that Applicants understand the question, and without waiving their objections, Applicants respond as follows:

The CEA addresses the replacement of the existing aged transmission line with known anomalies (Line 1600) with a new pipeline designed and constructed to modern standards (Alternatives C1-C7, D, I, J1-J3 and K). It is the new transmission pipeline designed and constructed to modern standards that influences that safety scoring of the Proposed Project and the Alternatives.

See also response to Question 11 above.

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QUESTION 13:

Regarding item 1.5 “Achievement of ‘as soon as practicable’ safety objective, at page 37 of the CEA, does SoCalGas/SDG&E have the ability to control some of the schedule by which a given alternative is completed or in-service?

RESPONSE 13:

It depends. Applicants determine the requirements and have the ability to control many of the activities within an overall project schedule to complete and place in service the Proposed Project or an alternative. Applicants are solely responsible for and have been striving to expedite those activities for the Proposed Project. These activities include preliminary engineering and design, proponent’s environmental assessment studies/surveys and the regulatory application.

Applicants have minimal ability to influence and/or control the schedule for regulatory proceedings and the California Environmental Quality Act (CEQA)/National Environmental Protection Act (NEPA) processes for the Proposed Project or alternatives. Additional items that can affect Applicants’ ability to implement the project that the Applicants have limited control over include local permitting restrictions such as unanticipated limited work hours in traveled roadways, construction moratoriums during certain periods of the year, restrictions on length of roadway that can be in construction at a given time, traffic control restrictions, inclement weather, unanticipated groundwater, rock formations, contaminated soil, cultural remains and nesting birds. Other factors that Applicants have limited control over include contractor and workforce availability, potential labor strife, material availability and potential litigation necessary to settle disputes with the public, local government or other parties.

Upon completion of the regulatory and CEQA/NEPA processes, Applicants will then update the project schedule and have reasonable control, subject to the above listed limitations, of schedule for engineering, materials procurement, right-of-way acquisition and construction. Figure 2 at page 26 of the Prepared Direct Testimony of Neil Navin presents the Proposed Project schedule and timing/relationship of the project tasks.

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QUESTION 14:

Given instructions by Resolution SED-1 to reduce the operating pressure of Line 1600 to 512 psig, what score would be assigned under item 1.1 at this maximum allowable operating pressure?

RESPONSE 14:

The scoring scale for item 1.1 is:

- 1 = N/A
- 2 = Line 1600 operating at 800 psi (49% SMYS) - Transmission Function
- 3 = Line 1600 operating at 640 psi (39% SMYS) - Transmission Function
- 4 = Line 1600 operating at 320 psi (<20% SMYS) - Distribution Function
- 5 = Removal of Line 1600

Given the change in Line 1600 operating pressure to 512 psig, the scores for the Alternatives that originally scored a 4 - all of the Alternatives except the Hydrotest Alternative (Alternative B) and Replace Line 1600 in Place (Alternative D) - would not change because Line 1600 would be de-rated to 320 psi for all these alternatives.

The score for Alternative B (score 3) would remain a score of 3 because Line 1600 would still be operating above 20% SMYS.

The score for Alternative D (score 5) is not influenced by operating pressure because Line 1600 would be taken out of service and replaced with a new pipeline and would not change.

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QUESTION 15:

Has SoCalGas/SDG&E conducted any engineering assessment for how long Line 1600 would remain safe at a pressure of 800 psig? At 640 psig? 540 psig? Or 320 psig? If so, please provide a copy of the assessment. If not, please explain how SoCalGas/SDG&E have determined a 20 year remaining useful life.

RESPONSE 15:

An engineering remaining life assessment has not been conducted for Line 1600. As part of TIMP, a reassessment interval of 7 years has been established for Line 1600, and this assessment includes review of the fatigue threat at 800 psig and 640 psig (see attached Fatigue Report, which **contains confidential information provided pursuant to P.U. Code § 583 and General Order 66-C and the accompanying declaration**). It should be noted that while the attached Fatigue Report provides an analysis of the remaining life of the pipeline due to a single threat (fatigue), it is not a comprehensive engineering assessment of the remaining life of the pipeline given that other potential threats on the pipeline have not been evaluated, including but not limited to time dependent threats such as wall loss, stable threats such as manufacturing and seam related anomalies, time-independent threats such as third party damage, and the potential for interactive threats including metal loss coincident with the seam weld (see Prepared Direct Testimony of Travis Sera at page 4, lines 7-12; and page 5, lines 1-7).

The 20 year remaining life is based upon engineering judgment. Consideration was given to the vintage and condition of the pipeline, the presence of manufacturing related long seam anomalies, a reasonable assumption of the benefits from a successful pressure test of the line, and an acknowledgment that the pipeline life is not infinite. Additionally, consideration included recognition of 49 CFR part 192.939 that specifies 10, 15, and 20 years as the maximum intervals that can be established using pressure testing to sufficient levels for pipelines that operate at >50%SMYS, ≥30%SMYS to 50%SMYS, and <30% SMYS respectively.

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QUESTION 16:

On page 36 of the CEA, Section 1.1, in evaluating the increased safety margin to prevent pipeline rupture through the de-rating of Line 1600, do any of the assigned scores account for whether the act is feasible? For example, removal of Line 1600 is given a safety score of “5”. Is it contemplated in the CEA whether such an act is feasible from a reliability point of view? If so, please identify where it is contemplated and provide the page number.

RESPONSE 16:

Applicants object that this Question is vague and ambiguous in that it does not indicate the context in which it asks whether “such an act is feasible from a reliability point of view.” Without waiving its objection, and attempting to interpret the Question, Applicants respond as follows:

The CEA assumes that it is technologically feasible to derate Line 1600 (see Prepared Direct Testimony of Travis Sera, page 2, lines 18-19).

The Prepared Direct Testimony of Douglas M. Schneider addresses the derating of Line 1600 (page 11, lines 1-18).

The CEA assesses the reliability of “removal of Line 1600” in the context of the various project alternatives, and provides a reliability score for each such alternative. Whether it is “feasible” to reduce or impair reliability is a policy decision.

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QUESTION 17:

Has the Pipeline Hazardous Materials Safety Administration (PHMSA) issued any guidance, directives, or other information to pipeline operators as to what documents do and do not meet the requirements for applying 49 Code of Federal Regulations § 192.619(c)? If so, please provide a copy of the relevant document from PHMSA, as well as proof of SoCalGas/SDG&E's compliance with maintaining the appropriate records.

RESPONSE 17:

Applicants object to Question 17 as vague and ambiguous in asking what “documents do and do not meet the requirements for applying 49 Code of Federal Regulations § 192.619(c).” Further, Applicants object that Question 17 seeks publicly available documents equally accessible to ORA to the extent that that “Pipeline Hazardous Materials Safety Administration (PHMSA) [has] issued any guidance, directives, or other information to pipeline operators.” Applicants further object that Question 17 seeks information not relevant to any issue presented in this Application. Applicants further object that Question 17 is vague, ambiguous, and overbroad in seeking “proof of SoCalGas/SDG&E’s compliance with maintaining the appropriate records.”

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QUESTION 18:

Do SoCalGas/SDG&E's assessments of risk in the CEA include any element of calculation of the number of miles of pipelines in High Consequence Areas? Please explain how the Table 29 risk scores at page 63 translate into the safety scores starting at page 36.

RESPONSE 18:

Yes, Applicants' assessment of risk in the CEA includes the pipeline miles in High Consequence Areas. Specifically, the pipeline failure analysis (CEA pages 58-63) defines risk as:

Risk = Likelihood of Incident x HCA Miles.

The number of HCA miles is a key consideration in the pipeline failure analysis.

The risk scores in Table 29 are the basis for the item 1.3 scores in Table 36. The scale for scoring the projects against item 1.3 is:

- 1 = > 25% increase in potential incidents/ HCA mile
- 2 = 0-25% increase in potential incidents/HCA mile
- 3 = No change in potential incidents/HCA mile likelihood
- 4 = 0-25% reduction in incidents/ HCA mile
- 5 = > 25% reduction in incidents/ HCA mile

Table 29 shows that the risk score for Line 1600 operating at Transmission pressure (Alternative B – Hydrotest) is 2.99. This is compared against the proposed alternative whose combined risk score is 2.06. As such, the reduction in incidents per HCA mile is given as:

$$\text{Reduction in Incidents per HCA Mile} = \frac{2.99 - 2.06}{2.99} = 31\%$$

This 31% reduction equates to a score of 5 for item 1.3.

All of the Alternatives the include design and construction of a new pipeline (Alternatives C1-C7, D, J1-J3, and K) similarly result in a reduction in incidents per HCA mile greater than 25% and also score a 5.

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The Alternatives that do not rely on constructing a new pipeline in the SCG/SDG&E service territory (Alternatives E/F, G, and H1–H2) by their nature result in the reduction in incidents per HCA mile greater than 25% and also score a 5.

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QUESTION 19:

In response to ORA DR-12, Question 7, SoCalGas/SDG&E responded that “approximately 32.11 miles” of Line 3602 would run through high consequence areas. Has the number of miles in HCAs changed since SoCalGas/SDG&E provided this response? If the answer is yes, please explain.

RESPONSE 19:

Since providing the response to Question 7 of ORA DR 12, the number of miles of proposed Line 3602 that would operate in an HCA has not changed.

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QUESTION 20:

How many miles of Line 1600 would be in High Consequence Areas if the line is derated to 320 psig?

RESPONSE 20:

If Line 1600 was derated to 320 psig, it would become a distribution pipeline and as such, the transmission integrity management provisions would no longer apply.

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QUESTION 21:

How many miles of Line 1600 run through High Consequence areas with an MAOP of 512 psig?

RESPONSE 21:

There are 31.8 HCA miles for Line 1600 operating with a pressure of 512 psig. The HCA mileage for Line 1600 was determined per Method 1 of 49 CFR § 192.903. This method identifies all transmission pipe operating in Class 3 and accounts for all the HCA mileage for the prescribed operation conditions.

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QUESTION 22:

Does remediation (eliminating causal factors of a defect from an unacceptable condition to an acceptable condition [Prepared Testimony of T. Sera, p. 8, fn 12]) increase the future resiliency or strength of design of a pipeline? Please explain.

RESPONSE 22:

Remediation has a beneficial impact on the future condition of a pipeline for some threats and not others, and remediation has no benefit regarding pipeline design beyond the limits of a repair area. For example, remediation of time dependent and stable flaws reduces risk – however, since remediation does not fundamentally change the design of a pipeline beyond the limits of a repair area, other time independent threats (such as third party damage) or interactive threats that may occur in areas comprised of vintage pipe still pose an increased risk to future resiliency.

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QUESTION 23:

Does mitigation (limitation or reduction of the probability of occurrence or expected consequence for a particular event [Prepared Testimony of T. Sera, p. 8, fn 13]) increase the future resiliency or strength of design of a pipeline? Please explain.

RESPONSE 23:

Mitigation has a beneficial impact on the future condition of a pipeline for some threats and not others, and remediation has no benefit regarding pipeline design beyond the limits of a repair area. For example, mitigation of time dependent and stable flaws reduces risk – however, since mitigation does not fundamentally change the design of a pipeline beyond the limits of a repair area, other time independent threats (such as third party damage) or interactive threats that may occur in areas comprised of vintage pipe still pose an increased risk to future resiliency.

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QUESTION 24:

Does the proposed route of Line 3602 cross any known fault lines?

RESPONSE 24:

No.

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QUESTION 25:

Does Line 1600 cross any known fault lines?

RESPONSE 25:

No.

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QUESTION 26:

Please provide any mathematical calculations supporting the differential between scores 1 to 5 for item 1.1 of the CEA at page 36.

RESPONSE 26:

There are no calculations supporting the differential between the scores 1 to 5 for item 1.1 of the CEA at page 36.

The score 1, "N/A" is not a numerical score.

The score 5, "Removal of Line 1600" is not a numerical score.

The scores 2, 3, and 4 are different operating pressures for Line 1600 and are based on Applicants' knowledge and experience from operating the system.

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QUESTION 27:

What type of mathematical function is used for the scores of 1 to 5 for 1.1 of the CEA at page 36? Please explain.

RESPONSE 27:

No mathematical function is used for the scores of 1 to 5 for item 1.1 of the CEA at page 36. Please see response to question 26 above.

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QUESTION 28:

What type of mathematical function is used in Figure 1 of the Direct Testimony of T. Sera at page 18? Please explain.

RESPONSE 28:

The equation used is referred to as the “Modified Ln-Sec Equation”, which is an improvement of the original NG-18 Ln-Sec Equation². For a full description of these equations, please refer to the following:

1 Kiefner, J.F., “Modified Equation Helps Integrity Management”, Oil and Gas Journal, Oct 6, 2008, pp 76-82 and “Modified Ln-Secant Equation Improves Failure Prediction”. Oct 13, 2008, pp 64-66.

2 Kiefner, J.F., Maxey, W.A., Eiber, R.J., and Duffy, A.R., “Failure Stress Levels of Flaws in Pressurized Cylinders,” Progress in Flaw Growth and Fracture Toughness Testing, ASTM STP 546, American Society for Testing and Materials, 1975, pp. 461-481.

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QUESTION 29:

What type of mathematical function is used in Figure 2 of the Direct Testimony of T. Sera at page 18? Please explain.

RESPONSE 29:

Please see the response to Question 28 above.

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QUESTION 30:

Is the relationship between the Leak versus Rupture line in either Figure 1 or Figure 2 linear?
Please explain.

RESPONSE 30:

No. Predicted rupture pressure decreases in a non-linear fashion with defect length.

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QUESTION 31:

What is the mathematical relationship between reduction in pressure on Line 1600 and the reduction of the number of structures within the potential impact radius of the pipeline? Please explain.

RESPONSE 31:

The Applicants use the equation identified in 49 CFR 192.903 to calculate its PIR. The number of structures within the PIR will vary based upon population density and the size of the PIR which is a function of pressure, diameter and the type of commodity present.

The Applicants are not aware of an equation that directly calculates structure count to changes in MAOP.

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QUESTION 32:

Has SoCalGas/SDG&E forecast the number of incidents per HCA mile (CEA, page 36, item 1.3) for the proposed Line 3602? If so, please provide. Otherwise, please explain.

RESPONSE 32:

No, the Applicants did not develop a forecast model for the number of incidents per HCA mile. A forecast of incidents would entail an econometric model composed of various factors and parameters that may affect the number of incidents per mile under the conditions of the proposed projects. In addition, due to the time independent nature of third party damage, incidents caused by third parties cannot be predicted, yet occur. The method used to calculate the %-change in potential incidents per HCA mile utilized historical PHMSA data to estimate the number of incidents that would potentially occur in a HCA-mile length of pipe.

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QUESTION 33:

Has SoCalGas/SDG&E provided any other methodology to calculate the probability the number of incidents per HCA mile? (CEA, page 36, item 1.3).

RESPONSE 33:

No, the Applicants did not provide any other methodology to calculate the probability of the number of incidents per HCA mile. This is because the methodology which was used is an accurate, industry-recognized approach for calculating the probability of an incident.

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QUESTION 34:

At page 63 of the CEA, the likelihood of an incident is given 0.0915 for Line 1600, and 0.064 for the proposed project. Would any new pipeline have a likelihood of an incident at 0.064? Please explain.

RESPONSE 34:

A new pipeline would not necessarily have an incident likelihood of 0.064. The incident likelihoods were based on historical incident data provided by PHMSA, taking into account factors such as diameter and age of pipe. As such, only an onshore pipeline with the same diameter and relative age as the proposed pipeline would have the same calculated incident rate likelihood per unit length of 0.064.

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QUESTION 35:

Please explain what is meant by “there was insufficient data to use pipelines exactly 16” in diameter” between 2000 and 2014 on page 60 of the CEA.

RESPONSE 35:

Calculations for incident likelihoods were based on historical incident data from PHMSA. The PHMSA database records only two incidents from 2000 to 2014 associated with 16” diameter pipe. A sample size of two is insufficient to substantiate a meaningful result. Expanding the range of pipe diameters to include pipelines between 12” and 20” resulted in a larger sample size of PHMSA incidents for use in the incident rate calculation.

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QUESTION 36:

Please confirm that SoCalGas/SDG&E have determined that the maximum reassessment interval is applicable under TIMP for Line 1600, and that therefore “When a covered segment is assigned a maximum reassessment interval, it confirms that the remaining flaws are not expected to exceed acceptable safety limits prior to the next assessment.” (Amended Application, p. 16).

RESPONSE 36:

The statement above is correct.

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PREPARED DIRECT TESTIMONY OF T. SERA

QUESTION 37:

The prepared direct testimony of T. Sera states at page 1: “The purpose [of my testimony] is to explain why replacing the existing transmission function of Line 1600 and converting the pipeline to distribution service, rather than pressure testing, would provide a greater margin of safety and overall risk reduction.” In the prepared testimony of T. Sera, in the application or supporting documentation, or in any other witness’s prepared testimony, is there any discussion of the increased consequences resulting from building a new gas transmission line? Please explain and provide reference to the document and specific page numbers if so.

RESPONSE 37:

Applicants object to Question 37 on the ground that Mr. Sera’s testimony, and the other referenced testimony and documentation speak for themselves. Applicants further object that Question 37 is vague, ambiguous, assumes facts not in evidence and, if intended to refer to a hypothetical project, is an incomplete hypothetical. Applicants further object that Question 37 refers to “increased consequences resulting from building a new gas transmission line,” but does not identify what this situation is to be compared to in order to assess whether consequences have increased, decreased or stayed the same. Nor does Question 37 explain what is meant by “increased consequences.” Without waiving its objections, and interpreting Question 37 as seems reasonable, Applicants respond as follows;

Determining the overall risk reduction (including the consequence portion of risk) in a gas transmission system requires consideration of the entirety of the Proposed Project. In the example of this Application, SDG&E and SoCalGas are proposing: (1) the installation of a new transmission pipeline manufactured and installed to meet, and in some instances exceed, applicable rules, laws, and regulations; and (2) the de-rating of an existing transmission pipeline that was installed in 1949 and has known manufacturing anomalies (including hook cracks).

Thus, installation of the new, proposed Line 3602 and de-rating Line 1600 decreases risk and increases safety margin relative to maintaining transmission operation of the existing Line 1600. Because construction of a new gas transmission pipeline allows de-rating of Line 1600, and because the new transmission line is constructed to modern standards, “consequences,” by which Applicants understand the question to mean risk, decreases. Mr. Sera’s testimony (at pages 14-15) includes a full description of the benefits to risk reduction that are afforded through a reduced potential impact radius resulting from transition of Line 1600 to distribution service

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pressure. Page 58 of the CEA defines Risk as the product of likelihood of an incident and high consequence area (HCA) miles; thus HCA miles in this case is a proxy for consequences of the Proposed Project. Table 29 on page 63 of the CEA provides an analysis of the increase in HCA mileage due to the construction of a new pipeline, and the net reduction in overall risk that would result from the Proposed Project.

The increase in safety margin and decrease in risk arising from de-rating Line 1600 is discussed throughout Mr. Sera's prepared testimony, the modern standards proposed for Line 3602 are discussed throughout Ms. Haines prepared testimony, and the CEA discusses safety benefits of the Proposed Project and alternatives at pages 34-41.

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QUESTION 38:

The prepared direct testimony of T. Sera states at pages 14-15 that “one of the ways in which pressure reduction on Line 1600 would reduce the consequences of failure is by reducing the PIR, in other words, shrinking the area affected by a potential release of gas.” Would adding a new gas transmission line increase consequences of failure?

RESPONSE 38:

Applicants object that Question 38 is vague, ambiguous and poses an incomplete hypothetical by asking whether “adding a new gas transmission line increase consequences of failure” without identifying what this situation is to be compared to in order to assess whether consequences have increased, decreased or stayed the same. Nor does Question 38 explain what is meant by “consequences of failure.” Without waiving its objections, and interpreting Question 38 as seems reasonable, Applicants respond as follows;

If by “consequences of failure,” ORA means the impact of a failure on a specific area around the location of a pipeline rupture, that impact will depend on what is located near the location of the pipeline rupture and the PIR. Determining the overall risk reduction (including the consequence portion of risk) in a gas transmission system requires consideration of the entirety of the Proposed Project. Page 58 of the CEA defines Risk as the product of likelihood of an incident and high consequence area (HCA) miles; thus HCA miles in this case is a proxy for consequences of the Proposed Project. Table 29 on page 63 of the CEA provides an analysis of the increase in HCA mileage due to the construction of a new pipeline, and the net reduction in overall risk that would result from the Proposed Project. Please also refer to Response 37 above.

In the example of this Application, SDG&E and SoCalGas are proposing: (1) the installation of a new transmission pipeline manufactured and installed to meet, and in some instances exceed, applicable rules, laws, and regulations; and (2) the de-rating of an existing transmission pipeline that was installed in 1949 and has known manufacturing anomalies (including hook cracks). Thus, installation of the new, proposed Line 3602 and de-rating Line 1600 decreases risk and increases safety margin relative to maintaining transmission operation of the existing Line 1600. Because construction of a new gas transmission pipeline allows de-rating of Line 1600, and because the new transmission line is constructed to modern standards, “consequences,” by which Applicants understand the question to mean risk, decreases.