Docket:	:	A.11-11-002
Exhibit Number	:	
Reference #	:	ORA-1-RH2_Atch
Commissioner	:	M. Florio
ALJ	:	D. Long
Witness	:	N. Skinner

OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

ORA Report on the Proposed Natural Gas Pipeline Safety Enhancement Plan of Southern California Gas Company and San Diego Gas & Electric Company

ATTACHMENTS

Testimony on Costs to Pressure Test Pipeline Installed Between 1956-1961

San Francisco, California
May 1, 2015

ATTACHMENTS TO ORA-1-RH2

PUBLIC DOCUMENTS

1. ASA Code Sections Summary

2. Excerpts from Ex. DRA-9 in A.11-11-002 (Sempra responses to DRA-DAO-27).

3. Statement of Pacific Gas and Electric Company in Case No. 6352 (which led to D.61269). (attached separately due to size).

4. Redacted Workpapers to ORA-1-RH2.

5. ASA 1955 B31.1.8 (attached separately due to size).

6. D.61269, Adopting GO 112 (attached separately due to size).

7. GO 112 with changes from ASA 1958 (attached separately due to size).

CONFIDENTIAL DOCUMENTS

8. Sempra Response to DR-DRA-16 (Confidential).
    a. Data Response and Spreadsheet.

9. Confidential Workpapers to ORA-1-RH2.

Attachment 1

ASA Summary Spreadsheet (reference document)

Class Location		ASA B31.1.8 1935 (1)	ASA B31.1-1942 (1) (2)	ASA B31.1-1951 (1)	ASA B31.1.8-1952 (1)
1 2	Div 2	150% of normal service pressure for valves and fittings [223a].	50 psi greater than maximum service pressure [223a]. Air or gas may be used if pressure shall not exceed 120% of MAWP [223b].	50 psi greater than maximum service pressure [223a]. Where an internal fluid test pressure is used, either 50 psi above the maximum service pressure, or 120%, whichever is greater [223b].	50 psig > max. service pressure [824a.1]. Where an internal fluid test pressure is used, is shall not exceed 50 psi greater than the maximum service pressure, or 120%, whichever is greater [824b].
3 4	Div 1	150% of normal service pressure for valves and fittings or pipe shall be capable of meeting the hydrostatic test requirements contained in the respecive material specifciation [222a], and for piping systems with welded joins [222b].	150% of normal service pressure [223a]. Air or gas may be used if pressure need not exceed 120% of MAWP [223b].	150% of the maximum service pressure [223a]. Shall not exceed 150% of the MAWP [223b].	150% of max. service pressure [824a.2]. Where an internal fluid test pressure is used, it shall not exceed 150% of the MAWP [824b].
Design		Div 2- Meet requirements in Table 9 (p. 48) and not greater than P=(2.52 Yt)/(FD) [223b]. Div 1 - Meet requirements in Table 9 (p. 48) for pipe, vales and fittings equal to Table 11 (p. 56) [222a].	150% of normal service pressure for valves and fittings [222a]. Pipe shall be subjected to and withstand an internal hydrostatic mill test without showing failure, leakage or distress… [222c].	Valves and fittings shall be subjected to and withstand an internal hydrostatic mill test without showing failure, leakage, distress or distortion … an internal hydrostatic pressure of 150% the maximum service pressure….[222a]. Pipe shall be subjected to and withstand an internal hydrostatic mill test without showing failure, leakage, distress, or distortion… [222e].	85% if tested after installation, otherwise generally 80% of mill test pressure [807c, p. 13].
General Notes		Post installation tests not required if impracticable (Div 1) [222b].			Pipe shall be subjected to and withstand an internal hydrostatic mill test without showing failure, leakage, distress, or distortion… [807b.2]. MAWP shall not exceed the least of the MAWP of the components of the piping system [825].

(1) Used 2 divisions, rather than the more current 4 Class Locations.
(2) Tie-ins are not required to be tested [841.31 in ASA 1955, 1958, 1963, 1967, 1968, or GO 112].

Glossary

MAWP = Maximum Allowable Working Pressure
MOP = Maximum Operating Pressure
MAOP = Maximum Allowable Operating Pressure
DP = Design Pressure
TP = Test Pressure
SMYS = Specified Minimum Yield Strength

ASA B31.8-1955 (2)			ASA B31.8-1958 (2)			GO 112 (1961)		
>= 30% of SMYS	**100 psi <> 30% SMYS**	**<100 psi**	**>= 30% of SMYS**	**100 psi <> 30% SMYS**	**<100 psi**	**>= 20% of SMYS**	**20%SMYS <>100psi**	**<100 psi**
Minimum using water, air, or gas is 1.1x MOP; Maximum is none for water, 1.1 DP for air or gas [Table 841.412(d)].	Maximum % SMYS is 79.2% gas, 79.2% air, and N/A for water [841.42].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].	Minimum using water, air, or gas is 1.1x MOP; Maximum is none for water, 1.1 DP for air or gas [Table 841.412(d)].	Maximum % SMYS is 79.2% gas, 79.2% air, and N/A for water [841.42].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].	Minimum test pressure is 1.25x MOP [or] 90% of the mill test pressure, which ever is the lesser [209.11].	Maximum % SMYS is 79.2% gas, 79.2% air, and N/A for water [841.42].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].
Minimum using water or air is 1.25x MOP; maximum is none for water, 1.25 DP for air [Table 841.412(d)].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].		Minimum using water or air is 1.25x MOP; maximum is none for water, 1.25 DP for air [Table 841.412(d)].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].		Minimum test pressure is 1.25x MOP or 90% of the mill test pressure, which ever is the lesser [209.11].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].	
Hydrotest minimum pressure is 1.4x MOP; maximum is none [Table 841.412(d)].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water [841.42].		Hydrotest minimum pressure is 1.4x MOP; maximum is none [Table 841.412(d)].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water [841.42].		Minimum test pressure is 1.5x MOP or 90% of the mill test pressure, which ever is the lesser [209.12].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water	
	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].			Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].		Minimum test pressure is 1.5x MOP [or] 90% of the mill test pressure, which ever is the lesser [209.12].	Tested to at least 1.5x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].	
P shall not exceed 85% of the mill test pressure [841.14].			P shall not exceed 85% of the mill test pressure [841.14].			P shall not exceed 85% of the mill test pressure [841.14].		
MAOP is (TP/Pressure Factor) or DP [Table 841.412(d)]. Hydrostatic testing requirements for Class 3 and 4 locations do not apply if ground temperature is <= 32 degrees F or may fall to that temperature, quality water is not available in sufficient quantity. In that case, test with air to 1.1 times MOP [841.413]. Air testing may be used is Class 3 and 4 locations if the maximum hoop stress during test is less than 50% and 40% of SMYS respectively, maximum pressure will not exceed 80% of field test pressure used, and the pipe is new pipe with a longitudinal joint factor E of 1.00 [841.416].			MAOP is (TP/Pressure Factor) or DP [Table 841.412(d)]. Hydrostatic testing requirements for Class 3 and 4 locations do not apply if ground temperature is <= 32 degrees F or may fall to that temperature, quality water is not available in sufficient quantity. In that case, test with air to 1.1 times MOP [841.413]. Air testing may be used is Class 3 and 4 locations if the maximum hoop stress during test is less than 50% and 40% of SMYS respectively, maximum pressure will not exceed 80% of field test pressure used, and the pipe is new pipe with a longitudinal joint factor E of 1.00 [841.416].			Test shall not be less than 1 hour in duration [209.14]. Tie-ins, where impractical to test for strength, inspect for quality at least equal to the strength tested portions of pipe [209.15]. Any change in MAOP requires filing a report with the CPUC giving the new MAOP, the reason for the change, and if increased what steps were taken to determine capability of pipe to meet pressure [401.4].		

ASA B31.8-1963 (2)			ASA B31.8-1967 (2)		
>= 30% of SMYS	**100 psi <> 30% SMYS**	**<100 psi**	**>= 30% of SMYS**	**100 psi <> 30% SMYS**	**<100 psi**
Minimum using water, air, or gas is 1.1x MOP; Maximum is none for water, 1.1 DP for air or gas [Table 841.412(d)].	Tested in accord with [841.43]. Test demonstrate the pipe does not leak [841.431]. Tested to 20% SMYS or more with air or gas, test shall be in the range of 100 psi or walked while stress held at appx. 20% [841.433].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].	Minimum using water, air, or gas is 1.1x MOP; Maximum is none for water, 1.1 DP for air or gas [Table 841.412(d)].	Tested in accord with [841.43]. Test demonstrate the pipe does not leak [841.431]. Tested to 20% SMYS or more with air or gas, test shall be in the range of 100 psi or walked while stress held at appx. 20% [841.433].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].
Minimum using water or air is 1.25x MOP; maximum is none for water, 1.25 DP for air [Table 841.412(d)].	Tested to at least 1.25x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].		Minimum using water or air is 1.25x MOP; maximum is none for water, 1.25 DP for air [Table 841.412(d)].	Tested to at least 1.25x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].	
Hydrotest minimum pressure is 1.4x MOP; maximum is none [Table 841.412(d)].	Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water [841.42].		Hydrotest minimum pressure is 1.4x MOP; maximum is none [Table 841.412(d)].	Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water [841.42].	
	Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].			Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].	
P shall not exceed 85% of the mill test pressure [841.14].			P shall not exceed 85% of the mill test pressure [841.14].		
MAOP is (TP/Pressure Factor) or DP [Table 841.412(d)]. Hydrostatic testing requirements for Class 3 and 4 locations do not apply if ground temperature is <= 32 degrees F or may fall to that temperature, quality water is not available in sufficient quantity. In that case, test with air to 1.1 times MOP [841.413]. Air testing may be used is Class 3 and 4 locations if the maximum hoop stress during test is less than 50% and 40% of SMYS respectively, maximum pressure will not exceed 80% of field test pressure used, and the pipe is new pipe with a longitudinal joint factor E of 1.00 [841.416].			MAOP is (TP/Pressure Factor) or DP [Table 841.412(d)]. Hydrostatic testing requirements for Class 3 and 4 locations do not apply if ground temperature is <= 32 degrees F or may fall to that temperature, quality water is not available in sufficient quantity. In that case, test with air to 1.1 times MOP [841.413]. Air testing may be used is Class 3 and 4 locations if the maximum hoop stress during test is less than 50% and 40% of SMYS respectively, maximum pressure will not exceed 80% of field test pressure used, and the pipe is new pipe with a longitudinal joint factor E of 1.00 [841.416].		

ASA B31.8-1968 (2)			Subpart J (1970)	
>= 30% of SMYS	**100 psi <> 30% SMYS**	**<100 psi**	**>= 30% of SMYS, before 11/12/1970**	**>= 30% of SMYS, after 11/11/1970**
Minimum using water, air, or gas is 1.1x MOP; Maximum is none for water, 1.1 DP for air or gas [Table 841.412(d)].	Tested in accord with [841.43]. Test demonstrate the pipe does not leak [841.431]. Tested to 20% SMYS or more with air or gas, test shall be in the range of 100 psi or walked while stress held at appx. 20% [841.433].	Shall be leak tested to determine they are gas tight [841.441]. Gas may be used as the test medium, but a soap bubble test may be used if all joints are accessible [841.442]. Testing at available distribution system pressures as provided for above in 841.442 may not be adequare [if coatings are used] the leak test pressure shall be 100 psi [841.443].	Minimum using water, air, or gas is 1.1x MAOP; Maximum is none for water, 80% SMYS for gas or air [192.503c].	Minimum using water, air, or gas is 1.1x MAOP; Maximum is none for water, 80% SMYS for gas or air [192.503c].
Minimum using water or air is 1.25x MOP; maximum is none for water, 1.25 DP for air [Table 841.412(d)].	Tested to at least 1.25x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 75% for air, and N/A for water [841.42].		Minimum using water, air, or gas is 1.25x MAOP; Maximum is none for water, 30% SMYS for gas or 75% SMYS for air [192.503c].	Minimum using water, air, or gas is 1.25x MAOP; Maximum is none for water, 30% SMYS for gas or 75% SMYS for air [192.503c].
Hydrotest minimum pressure is 1.4x MOP; maximum is none [Table 841.412(d)].	Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 50% for air, and N/A for water [841.42].		Minimum using water, air, or gas is 1.4x MAOP; Maximum is none for water, 30% SMYS for gas or 50% SMYS for air [192.503c].	Minimum using water, air, or gas is 1.5x MAOP; Maximum is none for water, 30% SMYS for gas or 50% SMYS for air [192.503c].
	Tested to at least 1.4x MOP, however no medium shall be used that generates a higher hoop stress than 30% for gas, 40% for air, and N/A for water [841.42].		Minimum using water, air, or gas is 1.4x MAOP; Maximum is none for water, 30% SMYS for gas or 40% SMYS for air [192.503c].	Minimum using water, air, or gas is 1.5x MAOP; Maximum is none for water, 30% SMYS for gas or 40% SMYS for air [192.503c].
P shall not exceed 85% of the mill test pressure [841.14].			Previously tested pipe, within 18 months of a class location change, has different test ratios: Class 2 - 0.8x TP; Class 3 - 0.667x TP; and Class 4 - 0.555x TP [192.611].	
MAOP is (TP/Pressure Factor) or DP [Table 841.412(d)]. Hydrostatic testing requirements for Class 3 and 4 locations do not apply if ground temperature is <= 32 degrees F or may fall to that temperature, quality water is not available in sufficient quantity. In that case, test with air to 1.1 times MOP [841.413]. Air testing may be used is Class 3 and 4 locations if the maximum hoop stress during test is less than 50% and 40% of SMYS respectively, maximum pressure will not exceed 80% of field test pressure used, and the pipe is new pipe with a longitudinal joint factor E of 1.00 [841.416].			8 hour duration	8 hour duration [192.505c], except for short sections of pipe or fabricated units, in which case a 4 hour minimum pre-installation test is allowed [192.505e].

Attachment 2

Excerpts from Ex. DRA-9 in A.11-11-002 (Sempra responses to DRA-DAO-27).

APPENDIX A

Excerpts from Ex. DRA-9 in A.11-11-002

(Sempra responses to DRA-DAO-27)

EX DRA-9

Received 8/21/2012

Docket	:	R.11-11-002
Exhibit Number	:	
Commissioner	:	Florio
ALJ	:	Long
Witness	:	

DIVISION OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

Cross Examination Exhibit _____

DRA-DAO-27

San Francisco, California

OIR ON THE COMMISSION'S OWN MOTION TO ADOPT NEW SAFETY AND RELIABILITY REGULATIONS FOR NATURAL GAS TRANSMISSION AND DISTRIBUTION PIPELINES AND RELATED RATEMAKING MECHANISMS (R.11-02-019)

(DATA REQUEST DRA-DAO-27)

QUESTION DRA-DAO-27-04:

On page 38 of the testimony, Sempra states, "This does not imply, however, that there were no standards in place to govern pressure test activity prior to 1961. Indeed, at the time, operators followed industry testing standards such as American Standards Association B31.8, which subsequently became the American Society of Mechanical Engineers B31.8." Please answer the following questions:

a. Did SoCalGas/SDG&E, or its predecessors, adhere to the ASA B31.8 standards governing pressure test activity prior to 1961? If not, please explain.
b. If the answer to 27.3(a) is yes, identify the period over which SoCalGas/SDG&E, or its predecessors, adhered to the ASA standards governing pressure test activity?
c. Did SoCalGas/SDG&E, or its predecessors, adhere to any standards other than ASA's for pressure test activity? If yes, please identify and provide a copy of the standard(s).

RESPONSE DRA-DAO-27-04:

a. SoCalGas/SDG&E and their predecessors were key stakeholders and participants in the development of industry standards, and through the years have been actively involved in all phases of standards development and implementation. Employees of Southern California Gas Company (SoCalGas) and Southern Counties Gas Company, one of two other gas companies owned by Pacific Lighting Corporation that were merged with SoCalGas in 1970, served on the American Standards Association B31.1.8 Code Committee during the development and publication of the 1952, 1955 and 1958 Code Editions. Mr. Fredrick A. Hough, Vice president of Southern Counties Gas Company, served as Chairman of the newly formed Section 8 Committee of the ASA B31.1 Code in 1952, with Mr. C.T. Sweitzer of Southern California Gas Company serving as Committee Secretary. The first Code document published under the Section 8 Committee was in 1955 as ASA B31.1.8 Gas Transmission and Distribution Piping Systems.

   One of the most significant changes in Code that resulted from the Section 8 Committee and was published in the ASA B31.1.8-1955 Code was the establishment of explicit requirements for post construction pressure testing. Prior to this ASA B31.1 Code edition, post construction pressure testing was not a requirement.

   Given the level of participation and leadership provided by members of our companies, it is highly probable that the ASA B31.1 Standards governing pressure test activity prior to 1961 were followed.

b. Please refer to Response DRA-DAO-27-04(a).

OIR ON THE COMMISSION'S OWN MOTION TO ADOPT NEW SAFETY AND RELIABILITY REGULATIONS FOR NATURAL GAS TRANSMISSION AND DISTRIBUTION PIPELINES AND RELATED RATEMAKING MECHANISMS (R.11-02-019)

(DATA REQUEST DRA-DAO-27)

---

c. While we do believe in-house best practices were in place that met or exceeded the codes in effect at the time, we have not yet discovered any written formal documentation to confirm this. These best practices would have been modeled after industry best practices developed by organizations such the American Gas Association and Pacific Coast Gas Association.

Attachment 3

Statement of Pacific Gas and Electric Company in Case No. 6352 (which led to D.61269). (attached separately due to size).

Attachment 4

Redacted Workpapers

1 **The information used to generate these workpapers has been marked confidential by Sempra.**

2 **Therefore, this version has all data redacted, leaving in only cells with text generated by ORA or with formulae created by ORA.**

3 Note: Columns D and F have been blanked out. They performed a percentage calculcation, and therefore present a Div error.

Table 1-1 (Redacted)
Sempra Records of Pressure Tests, 1956-1961

	Segments	Segment Feet
All Mileage (1)		
No Records (2)		
ORA Analysis 1956-1961		
Complete Record (3)		
Pressure, Medium, and Duration (4)		
Other (5)	0	0
Total	**0**	**-**

(1) Column R (Install_Date) filtered to contain only 1956 to 1961.

(2) Test Date, Test Pressure, Test Medium, Test Duration all filtered to "Unknown" or "Blank"

(3) Test Date between 1/1/1956 and 6/30/1961. Test Pressure, Test Medium, Test Duration all filtered to exclude "Unknown" or "Blank".

(4) Test Date included "Unknown" or "Blank". Pressure, Medium, and Duration all had values other than "Unknown" or "Blank".

(5) Any other grouping of data where there was some form of record.

Table 1-2 (Redacted)
Sempra Records of Pressure Tests, 1956-1961
Pipe less than 30% SMYS

	Segments	Segment Feet
All Mileage (1)		
No Records (2)		
ORA Analysis 1956-1961		
Complete Record (3)		
Pressure, Medium, and Duration (4)		
Other (5)	0	-
Total	**0**	**-**

(1) Column R (Install_Date) filtered to contain only 1956 to 1961. Column K (Percent_SMYS) filtered to contain only pressures less than 30% SMYS.

(2) Test Date, Test Pressure, Test Medium, Test Duration all filtered to "Unknown" or "Blank".

(3) Test Date between 1/1/1956 and 6/30/1961. Test Pressure, Test Medium, Test Duration all filtered to exclude "Unknown" or "Blank".

(4) Test Date included "Unknown" or "Blank". Pressure, Medium, and Duration all had values other than "Unknown" or "Blank".

(5) Any other grouping of data where there was some form of record.

Attachment 5

ASA 1955 B31.1.8 (attached separately due to size).

Attachment 6

D.61269, Adopting GO 112 (attached separately due to size).

Attachment 7

GO 112 with changes from ASA 1958 (attached separately due to size).

Attachment 8 – Excluded due to Confidentiality

Sempra Response to DR-DRA-16 (Confidential).

a. Data Response and Spreadsheet.

Attachment 9 – Excluded due to Confidentiality

Confidential Workpapers to ORA-1-RH2