

CHAPTER IV WORKPAPER SUMMARY
Transmission Pipeline Enhancement Plan

SoCalGas Workpaper

Workpaper	Testimony Section	Corresponding Testimony Tables	Workpaper Page
Phase 1A Pipeline Miles and Subprioritization	IV.D.1 and IV.D.4	IV-5	WP-IV-2

SDG&E Workpaper¹

Workpaper	Testimony Section	Corresponding Testimony Tables	Workpaper Page
Phase 1A Pipeline Miles and Subprioritization	IV.D.1 and IV.D.4	IV-5	WP-IV-10

1. Line 1600 cannot be hydrotested until a replacement line is constructed. Line 1600 is planned to be In-Line Inspected using Transverse Flux Inspection (TFI) Technology in Phase 1A, and planned to be replaced in Phase 1B. Table IV-5 does not include Line 1600 because the replacement will not be completed until Phase 1B.

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SoCalGas Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

Description and Methodology

SoCalGas prioritized the pressure test or replacement of transmission pipelines in Phase 1A (2012 - 2015) to be pipelines or pipeline segments in Class 3 or 4 locations or Class 1 or 2 high consequence areas without sufficient documentation of post construction pressure tests to at least 1.25 times their maximum allowable operating pressure. Per the decision tree (Figure IV-1), these pipelines were arranged into one of five groups based upon the pipeline length, impacts to customers, and capability to be in-line inspected. The pipelines within each group were then sub-prioritized for project initiation purposes by the pipeline's potential impact radius (PIR) divided by a long seam factor. A pipeline's potential impact radius is calculated by squaring the diameter (inches) of the pipe and multiplying this value by the pipeline's MAOP (psig). The square root of this product is then multiplied by the constant 0.69 to provide the radius in feet. The formula is $PIR = 0.69 * \text{square root of } (MAOP * \text{Diameter}^2)$. The long seam factor is identified in 49 CFR 192.113. While these subprioritizations will be used to initiate projects, it is anticipated that many projects will be addressed in parallel to complete all Phase 1A work within the 4-year window. Also, any segments or lengths of pipeline that will be included outside the respective groups and this program are identified as "accelerated" lengths and are tabulated below in miles.

Phase 1A Subprioritization Groups 1 through 5

In support of the cost estimation process each Phase 1A pipeline was placed into one of five groups. The first group includes all test or replacement segments that were 1,000 feet or less in length. The second group includes pipelines that cannot be taken out of service for pressure testing due to non-manageable customer impact and are not piggable. Pipelines in the second group are planned for replacement in Phase 1A. The third group includes pipelines that are piggable but cannot be taken out of service for pressure testing due to non-manageable customer impact. Any pipeline in this group that cannot be replaced within the Phase 1A time period is planned for in-line inspection in Phase 1A with the replacement to be completed in Phase 1B (Box 6 in the decision tree). The fourth group of pipelines can be taken out of service, are not piggable, and are planned to be pressure tested in Phase 1A. The fifth group of pipelines can be taken out of service, are piggable, and are planned to be both in-line inspected and pressure tested in Phase 1A.

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SoCalGas Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

The tables below summarizes the Phase 1 groups and pipeline subprioritization.
Complete Direct Examination or Replace and Abandon Group 1 (Box 1)(1,000 feet or less criteria miles)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	1005 ID805-T	0.0042	0.0000
2	2000-0.18-XO2	0.0095	0.0000
3	1014	0.0030	0.0000
4	1018	0.0432	0.0048
5	247	0.0815	0.0000
6	2000-0.18-BO	0.0121	0.0000
7	1025	0.0721	0.0000
8	765BR4	0.0046	0.0000
9	408XO1	0.0106	0.0000
10	1171LT2	0.0117	0.0000
11	36-37	0.0220	0.0000
12	37-15	0.0074	0.0000
13	42-66-1	0.0358	0.0000
14	42-66-2	0.0261	0.0019
15	30-6200	0.0205	0.0007
16	2000-0.18-XO1	0.0093	0.0000
17	3000-261.73-BO	0.0016	0.0000
18	3000-261.73-BR	0.0045	0.0000
19	44-654	0.0098	0.0000
20	1230-A	0.0217	0.0000
21	1230-B	0.0009	0.0000
22	5009	0.0410	0.0000
23	41-19	0.0110	0.0000
24	1171LT1BP2	0.0172	0.0000
25	43-1106	0.1449	0.0000
26	33-121	0.1638	0.0000
27	41-6001-2	0.0045	0.0000
28	41-199	0.0072	0.0006
29	1172BP3	0.0119	0.0000
30	1172BP2ST4	0.0061	0.0000
31	1172 ID 2313 2	0.0150	0.0000
32	1017BR4	0.0045	0.0000
33	1017BR5	0.0045	0.0000
34	1017BR6	0.0045	0.0000
35	1017BR7	0.0049	0.0000
36	35-6416	0.0591	0.0739

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SoCalGas Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
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37	30-02-U	0.0229	0.0341
38	45-120X01	0.0017	0.0061
39	32-90	0.0348	0.0000
40	35-6405	0.1134	0.0166
41	35-6405BR1	0.0051	0.0000
42	1017BP1	0.0049	0.0000
43	1017BP2	0.0049	0.0000
44	1017BP3	0.0049	0.0000
45	41-04ST1	0.0013	0.0000
46	2007 ID629-T2	0.0028	0.0000
47	42-57	0.0104	0.0000
48	765-8.24-BO	0.0130	0.0000
49	765-8.24-BR	0.0010	0.0000
50	41-128	0.0006	0.0000
51	41-181	0.0025	0.0000
52	35-20-N	0.0097	0.0000
53	1172 ID 2313 1	0.0009	0.0000
54	1172 ID 2313 3	0.0094	0.0000
55	775BO1	0.0065	0.0000
56	775	0.0900	0.0000
57	30-6292	0.0104	0.0000
58	30-6799BR1	0.0032	0.0000
59	30-6799	0.0169	0.0000
60	41-17-F	0.0330	0.0000
61	41-198	0.0083	0.0052
62	41-201	0.0011	0.0069
63	36-7-04	0.0019	0.0000
64	41-116	0.0029	0.0032
65	41-116BP1	0.0021	0.0000
66	41-35-1-KST2	0.0004	0.0000
67	169	0.0117	0.0000
68	36-8-01-C	0.1642	0.0000
69	30-09-A	0.0006	0.0000
70	2002 ID465-T 2	0.0064	0.0000
71	2002 ID465-T 3	0.0019	0.0000
72	1003LT2	0.0032	0.0000
73	37-18-J	0.0120	0.0000
74	41-55	0.0070	0.0000
75	30-6543	0.0763	0.0000
76	35-6520	0.0008	0.0248

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

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77	37-6180	0.0199	0.0000
78	41-17-A2	0.0032	0.0000
79	41-17-FST1	0.0006	0.0000
80	41-101	0.0097	0.0000
81	36-8-06	0.0000	0.0422
82	1172BP2ST3	0.0028	0.0000
83	30-6209	0.0326	0.0000
84	41-83	0.0013	0.0000
85	1172BP2ST1	0.0007	0.0000
86	1172BP2ST2	0.0007	0.0000
87	41-117	0.0006	0.0030
88	42-12	0.0091	0.1539
89	41-6045	0.0095	0.0000
90	6100	0.0062	0.0000
91	41-141	0.0057	0.0000
92	1019BP1	0.0038	0.0000
93	1170 ID502-T 1	0.0011	0.0000
94	1171 ID567-P 13	0.0032	0.0000
95	765ST2	0.0020	0.0000
96	35-39	0.0303	0.0000
Total Group 1		1.76	0.38

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SoCalGas Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

Replace and Abandon Sub Group 2 (Box 2)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	1015	7.82	0.02
2	44-137	1.00	0.01
3	43-121	2.77	1.64
4	33-120	0.39	0.86
5	45-120	1.77	2.53
6	32-21	8.59	1.64
7	41-6000-2	11.37	24.58
8	1003	1.29	0.12
9	36-9-09 North	9.66	6.35
10	36-9-06	3.84	4.08
11	36-9-06-A	2.64	0.00
12	37-18-K	2.85	0.00
13	1011	1.83	3.30
14	35-20	0.56	0.00
15	37-18	3.56	0.60
16	37-18-F	2.06	0.00
17	30-18	2.14	0.45
18	37-49	0.81	0.27
19	31-09	7.35	5.46
20	37-07	2.67	0.01
21	45-163	0.79	0.12
22	43-34	1.58	1.71
23	36-1006	0.20	0.53
24	42-46	0.69	0.78
25	36-1032	0.70	0.84
26	38-514	0.17	4.10
27	37-04	4.52	4.50
28	53	0.88	0.39
29	35-20-A	1.32	0.00
30	35-10	2.36	1.08
31	41-30-A	0.26	0.00
32	41-25-A	4.78	0.04
33	41-30	3.89	0.06
34	30-02	1.56	1.27
35	38-200	0.23	0.00
36	38-501	1.15	0.84
37	41-80	0.01	1.82

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

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38	35-22	0.34	0.01
39	36-1002	0.07	0.14
40	41-84	0.83	0.18
41	41-84-A	0.23	0.00
42	44-687	0.05	0.17
43	36-8-01	5.44	0.16
44	38-351	4.05	0.00
45	38-512	2.24	2.55
46	8107	0.54	0.35
47	42-46-F	0.15	1.65
48	38-516	7.34	3.64
49	30-32	1.04	2.35
50	36-6588	2.14	0.42
51	41-04-I	0.35	0.03
52	36-1001	0.12	2.13
53	38-539	2.36	9.72
54	38-959	4.33	11.28
55	36-9-21	0.39	0.00
56	44-720	0.95	0.22
57	41-17	1.69	1.89
58	36-9-21BR1	0.00	0.28
59	41-05	2.76	0.02
60	41-05-A	0.41	0.00
61	38-508	0.50	0.00
62	38-523	0.25	2.66
63	35-20-A1	0.28	0.01
64	35-40	0.15	0.09
65	38-552	3.23	4.76
Total Group 2		142.30	114.72

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

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In-line Inspect (TFI) and Replace Group 3 (Box 3)

Priority	Line Number	Criteria Miles	Accelerated Miles
Total Group 3		0.00	0.00

(none planned at SoCalGas)

	Criteria Miles	Accelerated Miles
Total Group 2 + Group 3	142.30	114.72

Pressure Test Group 4 (Box 4)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	Playa del Rey	0.91	0.00
2	La Goleta	0.14	0.00
3	Honor Rancho	1.92	0.00
4	33-121	0.45	0.00
5	41-90	0.00	0.00
6	44-1008	1.88	8.19
7	38-528	2.43	1.75
8	41-25	0.12	0.00
9	36-1032	1.16	0.39
10	36-9-21	1.53	3.53
11	36-8-06	0.58	0.00
Total Group 4		11.12	13.86

CHAPTER IV WORKPAPER
Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SoCalGas Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

In-line Inspect (TFI) and Pressure Test Group 5 (Box 5)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	2000	55.03	62.57
2	2001 East	0.76	6.34
3	2001 West	15.81	48.29
4	1005	1.31	2.19
5	235 East	0.62	0.28
6	2003	26.22	0.28
7	407	6.25	0.05
8	4000	0.59	3.11
9	406	7.86	12.84
10	235 West	2.74	0.36
11	3000 East	0.26	11.64
12	1013	3.46	0.04
13	1004	12.72	6.98
14	404	24.45	13.35
15	1020	4.06	1.64
16	1024	1.15	0.05
17	317	1.57	0.00
Total Group 5		164.85	170.02

	Criteria Miles	Accelerated Miles
Total Group 4 + Group 5	175.98	183.87

Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SDG&E Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

Description and Methodology

SDG&E prioritized the pressure test or replacement of transmission pipelines in Phase 1A (2012 - 2015) to be pipelines or pipeline segments in Class 3 or 4 locations or Class 1 or 2 high consequence areas without sufficient documentation of post construction pressure tests to at least 1.25 times their maximum allowable operating pressure. Per the decision tree (Figure IV-1), these pipelines were arranged into one of five groups based upon the pipeline length, impacts to customers, and capability to be in-line inspected. The pipelines within each group were then sub-prioritized for project initiation purposes by the pipeline's potential impact radius (PIR) divided by a long seam factor. A pipeline's potential impact radius is calculated by squaring the diameter (inches) of the pipe and multiplying this value by the pipeline's MAOP (psig). The square root of this product is then multiplied by the constant 0.69 to provide the radius in feet. The formula is $PIR = 0.69 * \text{square root of } (MAOP * \text{Diameter}^2)$. The long seam factor is identified in 49 CFR 192.113. Although these subprioritizations will be used to initiate projects, it is anticipated that many projects will be addressed in parallel to complete all Phase 1A work within the 4-year window. Also, any segments or lengths of pipeline that will be included outside the respective groups and this program are identified as "accelerated" lengths and are tabulated below in miles.

Phase 1A Subprioritization Groups 1 through 5

In support of the cost estimating process, each Phase 1A pipeline was placed into one of five groups. The first group includes all test or replacement segments that measure 1,000 feet or less in length. The second group includes pipelines that cannot be taken out of service for pressure testing due to non-managable customer impact and are not piggable. Pipelines in the second group are planned for replacement in Phase 1A. The third group includes pipelines that are piggable but cannot be taken out of service for pressure testing due to non-managable customer impact. Any pipeline in this group that cannot be replaced within the Phase 1A time period is planned for in-line inspection during Phase 1A with the replacement to be completed under Phase 1B (Box 6 in the decision tree). The fourth group of pipelines can be taken out of service, are not piggable, and are planned to be pressure tested in Phase 1A. The fifth group of pipelines can be taken out of service, are piggable, and are planned to be both in-line inspected and pressure tested in Phase 1A.

Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SDG&E Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

The tables below summarizes the Phase 1 groups and pipeline subprioritization.

Complete Direct Examination or Replace and Abandon Group 1 (Box 1)(1,000 feet or less criteria miles)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	3010	0.0485	0.0000
2	49-32	0.0571	0.0000
3	49-20	0.0379	0.0000
Total Group 1		0.14	0.00

Replace and Abandon Group 2 (Box 2)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	49-28	1.80	3.10
2	49-17	5.94	0.55
3	49-19	1.31	0.36
4	49-16	0.72	8.87
5	49-25	1.57	0.71
6	49-11	0.34	0.00
7	49-18	7.20	0.11
8	49-26	2.40	0.22
9	49-27	1.44	0.00
10	49-14	0.32	2.13
11	49-15	1.98	4.63
12	49-22	3.91	0.12
13	49-13	3.46	0.00
Total Group 2		32.38	20.81

In-line Inspect (TFI Phase 1A) and Replace (Phase 1B) Group 3 (Box 3)(Replacement in Box 6)

Priority	Line Number	Criteria Miles	Accelerated Miles
1	1600	29.73	14.97
Total Group 3		29.73	14.97

Total Group 2 + Group 3 ⁽¹⁾	Criteria Miles	Accelerated Miles
	62.11	35.78

(1) Line 1600 cannot be hydrotested until a replacement line is constructed. Line 1600 is planned to be In-Line Inspected using Transverse Flux Inspection (TFI) Technology in Phase 1A, and planned to be replaced in Phase 1B. Table IV-5 does not include Line 1600 because the replacement will not be completed until Phase 1B.

Transmission Pipeline Enhancement Plan

WORKPAPER TITLE SDG&E Phase 1A Pipeline Miles and Subprioritization	FERC ACCT. N/A
WITNESS Douglas Schneider	

Pressure Test Group 4 (Box 4)			
Priority	Line Number	Criteria Miles	Accelerated Miles
1	49-18	0.31	0.00
2	49-32	0.20	0.00
3	49-15	0.00	0.31
Total Group 4		0.51	0.31

In-line Inspect (TFI) and Pressure Test Group 5 (Box 5)			
Priority	Line Number	Criteria Miles	Accelerated Miles
Total Group 5		0.00	0.00

(none planned at SDG&E)

Total Group 4 + Group 5	Criteria Miles	Accelerated Miles
	0.51	0.31