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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

MANLEY W. EDWARDS, Examiner, presiding.

In the Matter of the Application of PACIFIC GAS AND ELECTRIC COMPANY, a corporation, for an order of the Commission issuing to applicant a certificate of public convenience and necessity, under Chapter 5, Article 1, of the Public Utilities Code of the State of California for the construction, operation and maintenance of the natural gas pipeline project herein described.

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RECORDS	✓	P.G. & E. CO.	FILED
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Application No. 29548
(Amended 3rd Supplemental)

REPORTER'S TRANSCRIPT

San Francisco, California
November 22, 1955
Pages 1 - 138
Volume I

Reported by:

[Redacted], Official Reporter,
Public Utilities Commission, State of California,
Room 208, 515 Van Ness Ave., San Francisco, Calif.

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I N D E X

WITNESSES:

DIRECT CROSS REDIRECT

[REDACTED]	(rec)	6 78	81	
[REDACTED]	(rec) "	17	92	
HAAVIK, S A.	(rec)	29	104	
" " "	"			109
[REDACTED]	(rec) "	39	* 47 110	
[REDACTED]	(rec) "	56	* 75 114	
[REDACTED]		124		

* Questions for Clarification

EXHIBITS

IDEN EVID

SB-1		4	6
2		4	17
3		4	28
4		4	38
5		4	38
6		5	47
7		5	
8		5	
9		5	
10			
11 (late filed)			75

Handwritten notes and scribbles:
A line is drawn under exhibit 11.
There are various handwritten marks, including what appears to be "1.6" and "1.1", and other illegible scribbles.

BEFORE THE PUBLIC UTILITIES COMMISSION OF
THE STATE OF CALIFORNIA

* * * * *

[REDACTED] Examiner, presiding.

In the Matter of the Application of Pacific Gas and Electric Company, A corporation, for an order of the Commission issuing to applicant a certificate of public convenience and necessity, under Chapter 5, Article 1, of the Public Utilities Code of the State of California for the construction, operation and maintenance of the Natural gas pipeline project herein described.

} Application
No. 29548
(Amended 3rd Supplemental.)

APPEARANCES:

[REDACTED] and JOHN C. MORRISSEY,
[REDACTED]
appeared for the Applicant.

[REDACTED] by [REDACTED], [REDACTED]
[REDACTED]
appearing for California Manufacturers Association,
Interested Party.

[REDACTED], City Attorney, [REDACTED], Chief
Valuation and Rate Engineer, [REDACTED]
[REDACTED] appearing for the City and
County of San Francisco, Interested Party.

[REDACTED], State Building, San Francisco,
California, appearing for the Commission Staff.

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1 SAN FRANCISCO, CALIFORNIA, NOVEMBER 22, 1955 10 00 A.M

2 * * * * *

3 EXAMINER EDWARDS The Commission will be in order

4 The Commission has set a hearing this morning under
5 the amended Third Supplemental Application No 29548, in
6 the matter of the application of Pacific Gas and Electric
7 Company, a corporation, for an order of the Commission
8 issuing to applicant a certificate of public convenience
9 and necessity, under Chapter 5, Article 1 of the Public
10 Utilities Code of the State of California for the construc-
11 tion, operation and maintenance of the natural gas pipeline
12 project herein described

13 I have been handed appearance blanks by the following
14 parties

15 [REDACTED]
16 [REDACTED], appearing for the
17 applicant, Pacific Gas and Electric Company

18 [REDACTED]
19 [REDACTED], appearing for California
20 Manufacturers Association, interested party.

21 [REDACTED], City Attorney, [REDACTED], Chief
22 Valuation and Rate Engineer, 206 City Hall, San Francisco,
23 California, appearing for the City and County of San Fran-
24 cisco, interested party

25 [REDACTED], appearing for the Commission staff.

26 Are there any additional appearances?

1 (No response)

2 EXAMINER [REDACTED] Apparently not

3 Does the applicant have any notices?

4 [REDACTED] Yes, Mr. Examiner.

5 Pursuant to the request of the Commission we had
6 published notices of this hearing in several newspapers
7 at least five days prior to the date of the hearing

8 I have here in a blue cover affidavits of publication
9 indicating notice was published as required by the
10 Commission on November 16th in the San Francisco Chronicle,
11 San Francisco Examiner, Oakland Tribune, Sacramento Bee,
12 San Jose Mercury Herald, Stockton Record, Fresno Bee,
13 Bakersfield Californian, San Bernardino Evening Telegram
14 and the Evening Index, and on November 17th in the Barstow
15 Printer Review. There was also published in the Needles
16 Desert Sun a notice on November 16th, but I do not have
17 the affidavit of publication, but will file that later.

18 I hand you the series of affidavits

19 EXAMINER [REDACTED] Very well. These will be received
20 and made a part of the file herein

21 [REDACTED]: I have a request, Mr Examiner, that the
22 application be amended in one respect to correct a typo-
23 graphical error.

24 I refer to the amended Third Supplemental Application
25 29548, page 16, line 17, or rather line 7

26 EXAMINER [REDACTED] I have it.

1 [REDACTED]: The figure 706 should read 760.

2 EXAMINER [REDACTED]: That change is noted in the record
3 Is the applicant ready to proceed at this time?

4 [REDACTED]: Yes, I am, Mr Examiner.

5 By prior decisions, namely Nos. 42460, 47492 and
6 49101 in Application No. 29548 this Commission has issued
7 certificates of public convenience and necessity to the
8 Pacific Gas and Electric Company for construction, oper-
9 ation, maintenance and use of its so-called Topock-Milpitas
10 pipeline up to a daily capacity of 700,000,000 cubic feet
11 of gas per day

12 The applicant comes here today to support its pending
13 Amended Third Supplemental application for a further
14 certificate to authorize facilities needed to increase the
15 capacity of that Topock-Milpitas pipeline to 875,000,000
16 cubic feet daily

17 A certificate is also sought to exercise the rights
18 granted to the company by a general country franchise issued
19 to the company by Ordinance No. 760 of the County of San
20 Bernardino.

21 I suggest, Mr Examiner, that the exhibits in this
22 proceeding be identified at this time

23 I have prepared a typewritten list of proposed
24 exhibits, and I should like to go down through them
25 briefly

26 First I should suggest that they be offered as

1 Nos SB-1, SB-2, and so forth For the record I might
2 indicate that in the original hearing in this proceeding
3 relating to the original application the exhibits were
4 numbered serially in the subsequent hearing, on the sub-
5 sequent supplemental application they were numbered S-1,
6 and the third time we had a hearing in this matter they
7 were numbered SA-1. Here it is proposed that they bear
8 the designation SB-1, and so on, in this proceeding.

9 EXAMINER [REDACTED]: That will be satisfactory You may
10 proceed.

11 [REDACTED]: I will then read the titles of the
12 exhibits followed by the exhibit number.

13 "Documents to be deemed part of the record by
14 reference," SB-1.

15 "Maps and capital cost of proposed facilities for
16 increasing capacity of the Topock-Milpitas pipeline from
17 708.08 to 885.10 million cubic feet per day," SB-2

18 "Design data and flow diagrams of Topock-Milpitas
19 pipeline when El Paso delivery is 809 23 and 885 10 million
20 cubic feet per day," SB-3

21 "Forecast of maximum daily rates of availability of
22 gas supply to Northern California companies," SB-4

23 "Summarized recapitulation of maximum daily rates
24 of availability of gas supply to Northern California
25 companies," SB-5

26 "Northern California natural gas requirements and

1 relationship to supply," SB-6

2 "Cost of gas delivered from the Topock-Milpitas
3 pipeline with proposed facilities added," SB-7

4 "Letter agreement dated July 8, 1954, between
5 El Paso Natural Gas Company and Pacific Gas and Electric
6 Company," SB-8

7 "Letter agreement dated May 2, 1955 between Pacific
8 Gas and Electric Company and El Paso Natural Gas Company,"
9 SB-9

10 "Ordinance No. 760 of the Board of Supervisors of
11 San Bernardino County," SB-10

12 I might add that the exhibits Numbered 2, 3 -- I
13 should say SB-2, 3, 4, 5, 6 and 7 were furnished in advance
14 copies to the staff The Exhibits SB-8, 9, and 10 are
15 contained also in the application, or rather the SB-8 and
16 9 are contained in the application Ordinance No 760
17 is already on file with this Commission in another pro-
18 ceeding

19 I should like, then, Mr Examiner, first to direct
20 the Commission's attention to proposed Exhibit No. SB-1,
21 "Documents to be deemed part of the record by reference."

22 I won't read the list of some 15 items here, but
23 in general they are all related to the proceedings which
24 we have had under Application 29548 and are set out rather
25 specifically for the convenience of the Commission and the
26 parties.

1 EXAMINER [REDACTED]: If there is no objection, then, these
2 will be considered part of the record by reference.

3 Do you wish this exhibit received?

4 [REDACTED] Yes, I do.

5 EXAMINER [REDACTED]: Verywell. Exhibit No SB-1 is
6 received.

7 [REDACTED]: When the Commission is ready to proceed,
8 I should like to call as my first witness Mr [REDACTED]

9 [REDACTED]
10 [REDACTED] a witness called on behalf of the
11 Applicant, after having been first duly sworn, testi-
fied as follows:

12 DIRECT EXAMINATION

13 EXAMINER [REDACTED]: Please be seated and state your name
14 and address for the record.

15 THE WITNESS: My name is [REDACTED], [REDACTED]
16 and I reside in [REDACTED] at [REDACTED]

17 [REDACTED]: What is your position with the applicat,
18 [REDACTED]?

19 A I am Vice President in charge of gas operations

20 Q Would you please state briefly your education?

21 A. I was educated at Stanford University, Graduating in
22 Mechanical Engineering in 1921.

23 Q Would you also state please your experience?

24 A Immediately thereafter I entered the employ of the
25 Pacific Gas and Electric Company and have been since so
26 employed, except for the first year spent in its land

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department my work has had to do with gas matters.

From 1922 to 1929 I was engaged in the design of gas and generating equipment for the company's gas manufacturing plants

Between 1930 and 1935 I was associated with several developments, including odorization, pipeline flow theory, utilization and calorimetry of gas, following the introduction of natural gas to the Pacific Gas and Electric Company's system

I was also a member of the joint committee which produced California Natural Gasoline Association's Bulletin TS-353, and other gas measurement standards.

I have been a member of the Pacific Coast Gas Association for 27 years

Between 1936 and 1945 I was engaged in the design of distribution and transmission lines

Between 1946 and 1950 I assisted the Vice President and Executive Engineer in drafting natural gas purchase contracts and work on supply demand studies.

From 1950 through 1953 as General Superintendent of the Department of Technical Services I supervised transmission and distribution system planning including the Super-inch line, load estimating, geological surveys, field studies and tests, and all plant engineering and design including the compressor stations on the Super-inch lines and underground holder stations.

1 In January of 1954 I was appointed Vice President
2 in charge of gas operations having general supervision of
3 all transmission, distribution, production and utilization
4 matters in the company's system, and direct supervision of
5 the operation of the company's major transmission system

6 Q [REDACTED], do you have a copy of the proposed
7 Exhibit No. SB-2, entitled, "Maps and capital cost of
8 proposed facilities for increasing capacity of the Topock-
9 Milpitas pipeline from 708.08 to 885.10 million cubic feet
10 per day"?

11 A. I have

12 Q Was that exhibit prepared under your direction?

13 A. It was

14 Q Will you please in your own way now describe this
15 exhibit to the Commission?

16 A Page one of the Exhibit No. SB-2, entitled "Maps
17 and capital cost of proposed facilities for increasing
18 capacity of the Topock-Milpitas pipeline from 708 08 to
19 885 10 million cubic feet per day," following the flyleaf
20 labeled "809 23 M²cf per day project" is a map entitled,
21 "Northern California natural gas pipelines," as of November
22 1955, and this shows the transmission lines and principal
23 distribution trunk lines in the northern and central service
24 area of the Pacific Gas and Electric Company Shown also
25 are the locations of the company's compressor and holder
26 stations, principal metering and regulating stations and

1 gas manufacturing plants. Existing Pacific Gas and
2 Electric Company's mains are shown as a heavy solid line.
3 Mains of foreign companies and associated companies are
4 shown in dashed and dash-dot lines, respectively

5 The location of most of the gas fields feeding
6 the company's system are also indicated.

7 Page 2 of the exhibit is a map giving similar
8 information on the company's system for the southern
9 portion of the State of California as of November, 1955.

10 Q And do the two maps on pages 1 and 2 indicate the
11 entire natural gas system of the Pacific Gas and Electric
12 Company?

13 A They do, yes.

14 Q Will you turn to page 3 and tell us what that map
15 shows?

16 A Page 3 of the exhibit is a map bearing the title,
17 "Location of proposed facilities to increase the capacity
18 of the 34-inch Topock-Milpitas pipeline from 708.08 to
19 809.23 M²cf per day."

20 The map includes the portion of Central and Southern
21 California on which is shown in black the existing Topock-
22 Milpitas gas line starting at the Colorado River near
23 Topock, Arizona, at the right edge of the map and proceed-
24 ing westerly and northerly to Milpitas terminal near the
25 southern end of San Francisco Bay, together with the
26 installed compressor horsepower at each of the three

1 stations, Topock, Hinkley, and Kettleman Hills. Also shown
2 is the proposed 129.54 miles of 34-inch O.D. loop main
3 for increasing the delivery capacity for the line from
4 708 08 to 809 23 M²cf per day

5 Q [REDACTED], you heard me in my opening statement
6 indicate that the total requested increase capacity of the
7 pipeline would exceed 809.23, is that not so?

8 A Yes.

9 Q Then, would you explain why this map merely shows
10 the increased capacity for part of that?

11 Do you have another map as well?

12 A We have another map following another flyleaf together
13 with other data applying to the additional 75,000,000.

14 Q In other words, this exhibit is divided into two
15 parts?

16 A Into two parts, yes.

17 Q First for an increment up to 809?

18 A Yes.

19 Q And then another increment to bring it up to the
20 total that the Company is requesting in this proceeding,
21 is that right?

22 A That is right

23 MR. MORRISSEY: And I might add, Mr. Examiner, that that
24 is done for our convenience mainly because we had many of
25 these materials prepared in this manner and because as yet,
26 as will come out further in this proceeding, the Federal

1 Power Commission has not acted on our application, and I
2 think it is of convenience to the Commission to have this
3 material presented in parts, as it were I think that will
4 be self-evident as we go along, but I thought it well to
5 mention it right at the beginning so there would be no
6 question as to the manner of our proof.

7 Would you proceed, [REDACTED], with your descrip-
8 tion of that page?

9 A The loop main is comprised of 129.1 miles of pipe
10 between Topock compressor station and Milpitas and 44 miles
11 between the center of the Colorado River and Topock station
12 This particular project calls for no additional horsepower
13 at any of the existing compressor stations, but does include
14 additional pipe and other equipment at each of the
15 stations to accomodate the increased flow proposed by the
16 project.

17 The locations and lengths of five proposed loop
18 sections are shown in red

19 At the left of the map is a list of the existing
20 taps on the pipeline referring to locations on the map
21 from "A to M."

22 Q You stated, did you not, that to bring up the
23 capacity to the 809.3 M²cf per day that it is only
24 necessary to loop the lines without adding additional
25 compressor stations, is that correct?

26 A. No additional compressor stations nor compressors.

1 Q All right. Would you proceed now to page 4?

2 A Page 4 of the exhibit is a tabulation bearing the
3 title, "Detail of distance and pipe wall thickness be-
4 tween take off points on the 34-inch Topock-Milpitas
5 pipeline showing existing and proposed pipelines to in-
6 crease El Paso deliveries to PG&E company from 708.08
7 to 809.23 M² per day "

8 In the first column of this table there are listed
9 key points on the line denoting delivery taps, pressure
10 limiting stations, and compressor stations.

11 In the second column are shown cumulative mileages
12 from Topock for these key points and also for points of
13 change in pipe wall thickness, together with tie-in points
14 of existing and proposed loop sections

15 The third, fourth and fifth columns give pipe wall
16 thicknesses and mileages of all lengths between the afore-
17 mentioned points for the original line, the existing loops
18 and the proposed loops to raise the capacity to 809 23 M²cf
19 per day.

20 In the last column is shown the total mileages for
21 each of the resulting continuous loops

22 Q Now, would you turn to page 5?

23 A Page 5 of the exhibit is entitled, "Summary of
24 estimated capital cost to increase capacity of 34-inch
25 Topock to Milpitas pipeline project from 708.08 to 809.23
26 M² per day."

1 The summary shows an estimated capital cost of
2 \$720,000 for additions to the three existing compressor
3 stations covering piping and valves at Topock to provide
4 connections for the proposed loop line shown on the map
5 on page 3, and gas cooling facilities at Kettleman, together
6 with scrubbers and additional piping at all three stations
7 to care for the increase of flow contemplated by the
8 proposed project. No additional compressor horsepower is
9 to be installed. The estimated cost of land and land
10 rights amounted to \$254,000 and covers surveys and acquisi-
11 tion costs for fee and rights of way purchases, together
12 with estimated costs of crop and property damages result-
13 ing from the proposed construction.

14 The cost of pipe steel for the 129.1 miles of pipe-
15 line loop west and north of Topock station is given as
16 \$8,476,000

17 This covers the cost of the bare steel pipe in-
18 cluding freight charges for delivery to railhead points,
19 which will be used in the construction project.

20 The installation and other material costs for the
21 main pipeline amounting to \$4,631,000 includes costs for
22 protective coating, hauling and installation, together
23 with valves, fittings and piping used for connections and
24 blow-downs

25 Also included are State sales and use taxes and
26 contingencies at 1 percent of estimated labor and material

1 costs to cover unforeseen construction items

2 The \$160,000 estimated cost for measuring and
3 regulating stations covers additions at pressure limiting
4 stations Nos. 1 and 7 and at Milpitas terminal required
5 for the increased flow through the pipe system.

6 An estimated cost of \$155,000 is listed to cover
7 one half of the cost of an additional crossing of the
8 Colorado River. This is one half of the full cost of a
9 pipeline suspension bridge, including .44 miles of 34-inch
10 O D. pipe. The other half of the cost of the crossing is
11 to be paid for by El Paso Natural Gas Company The sum of
12 all of the above estimated costs gives a total direct cost
13 of \$14,396,000 to which has been added overhead at 6 percent,
14 amount to \$864,000 including provision for general engineer-
15 ing and administrative expense, interest during construction,
16 and other contingencies

17 This results in a total estimated cost of \$15,260,000
18 for the entire project designed to increase the capacity
19 of the Topock-Milpitas pipeline to 809.23 M² of per day.

20 Q [REDACTED], what is the date taken as the date at
21 which time estimates were made for material and labor
22 costs in these estimates?

23 A They are based on labor and material costs in effect
24 in September 1955.

25 Q Thank you. Now, would you turn to the second part
26 of this exhibit which follows the flyleaf entitled, "885 10

1 M²cf per day project," and describe that for us briefly?

2 A Page 1 following the flyleaf referred to is a
3 map showing in red the proposed looping of 20-1/2 miles
4 of 34-inch O.D. line for further increasing the capacity
5 from 809 23 to 885 10 M²cf per day.

6 The explanation given previously for the map on
7 page 3 of the 809.23 M²cf per day project applies in this
8 case as well, except for the following:

9 The construction earlier described for the 809.23
10 M²cf per day project is shown in blue. At Topock, Hinkley
11 and Kettleman compressor stations, respectively, the install-
12 ations of 5,000, 2,500 and 1,760 additional horsepower is
13 proposed.

14 Q Would you turn now to page 2 and describe that
15 briefly to us?

16 A Page 2 of the 885.10 M²cf per day project is
17 entitled, "Detail of distance and pipe wall thickness
18 between take-off points on the 34-inch Topock-Milpitas
19 pipeline showing existing and proposed pipelines to
20 increase El Paso deliveries to PG&E Company from 809.23
21 to 885 10 M² per day, ' and sets up for the 885.10 M² capacity
22 project the same type of pipeline thickness in mileage
23 detail as was set up on page 4 of the 809.23 M²cf per day
24 project.

25 Q Now, would you turn to page 3 and describe that for
26 us?

1 A Page 3 of the 885 10 M²cf per day project which is
2 entitled, "Summary of estimated capital costs to increase
3 capacity of 34-inch Topock to Milpitas pipeline project
4 from 809.23 to 885.10 M² per day," gives the same type
5 of summarized costs to bring the capacity of the facilities
6 up to an 885 10 M² per day project as were given to the
7 809.23 M²cf per day project on page 5.

8 The principal difference is that the cost of
9 compressor stations amounting to \$2,953,000 also includes
10 the installation of additional compressor horsepower at
11 Topock, Hinkley and Kettleman stations. Other costs are
12 lower than for the 809.23 M²cf per day project because of
13 the lesser length of loop line involved, that is, 20-1/2
14 versus 129.1 miles.

15 The total estimated cost of this additional 75 M²cf
16 per day project is \$5,426,000. As before, unit costs used
17 in making the estimate are September 1955.

18 Q ██████████, to the best of your knowledge and
19 belief are the facts set forth in this exhibit true and
20 correct?

21 A They are.

22 Q And where estimates are made are they reasonable
23 estimates?

24 A I believe they are.

25 ██████████: Mr Examiner, may this exhibit be
26 received into evidence?

1 EXAMINER [REDACTED]: Any objection to receiving Exhibit
2 SB-2?

3 (No response)

4 EXAMINER [REDACTED]: None appearing, Exhibit SB-2 is
5 received

6 [REDACTED]: That completes [REDACTED] direct
7 testimony

8 I would suggest, Mr. Examiner, in accordance with
9 the usual procedure in these cases that the applicant be
10 permitted to put on its entire case except for questions
11 for clarification and then there be questions for cross-
12 examination

13 EXAMINER [REDACTED]: That is satisfactory

14 [REDACTED] No questions for clarification

15 EXAMINER [REDACTED]: No questions at this time?

16 (No response)

17 EXAMINER [REDACTED]: You may stand aside, sir.

18 [REDACTED]: I would like to call [REDACTED]

19

20 recalled DIRECT EXAMINATION resumed

21 [REDACTED]: Mr. Examiner, [REDACTED] has previously
22 been sworn in this proceeding and his qualifications have
23 been previously stated and set forth

24 I just call that to your attention for the purpose
25 of the record

26 [REDACTED]: Very well. Do you desire to consider

1 him qualified for the testimony he will give?

2 [REDACTED]. Yes.

3 EXAMINER [REDACTED] Is that satisfactory to the parties?

4 [REDACTED] Satisfactory

5 [REDACTED] Yes.

6 EXAMINER [REDACTED] So stipulated

7 [REDACTED] What is your present position, Mr. Pugh?

8 EXAMINER [REDACTED] He has testified before in this matter?

9 [REDACTED] Yes, he has

10 In fact, Mr Examiner, all of the remaining witnesses
11 which the applicant proposes to call have been previously
12 sworn and qualified

13 EXAMINER [REDACTED] Very well

14 [REDACTED]: [REDACTED] what is your present position
15 with the applicant?

16 A I am Superding Gas Transmission Engineer in the
17 company's Department of Gas Operations

18 Q Do you have a copy of proposed Exhibit SB-3?

19 A Yes, I have.

20 Q What is that entitled?

21 A That Exhibit is entitled, "Design data and flow
22 diagrams of Topock-Milpitas pipeline when El Paso delivery
23 is 809.23 and 885.10 M²cf per day "

24 Q Did you prepare this document?

25 A Yes, I did

26 Q Would you please describe its contents, turning first

1 to the first flyleaf?

2 A The several pages after the first flyleaf relate
3 to the facilities to bring the pipeline deliveries up to
4 809 million cubic feet per day and the second part of
5 the exhibit after the second flyleaf is a parallel set
6 of sheets relating to the design considerations to bring
7 the deliveries from the Topock-Milpitas pipeline from
8 809 to 885 million cubic feet per day

9 Q Mr. Pugh, do you desire to make any additions to
10 the material presented in this exhibit?

11 A Yes, I do.

12 I would like to insert a reference to Exhibit SB-2
13 that was just testified to by Mr. Beckman. The reference
14 occurs at the bottom of page 4, which is entitled, "Flow
15 diagram data," in the next to last line in the blank
16 after "Exhibit No." the designation SB-2 should be in-
17 serted and similarly after the second flyleaf sheet on
18 page 4 in the same location the "SB-2" reference should
19 also be inserted.

20 EXAMINER EDWARDS That has been accomplished

21 MR. MORRISSEY: Please describe the first part of the
22 exhibit

23 A Page 1 is a flow diagram of the Topock-Milpitas
24 pipeline giving the receipts from the supply sources to
25 the pipeline, the en route deliveries, and the delivery
26 to the Milpitas end of the pipeline which were used to

1 determine the necessary additional loop main to receive a
2 delivery via Topock gateway of 809 million per day from
3 the El Paso Natural Gas Company. The locations and the
4 mileages of the proposed individual sections of 34-inch
5 loop line to be installed along the existing pipeline are
6 shown in red and aggregate 129 10 miles

7 In addition to the receipts and the en route
8 deliveries pressures along the pipeline and at the inlet
9 and outlet of the compressor stations are noted. The
10 volumes entering and leaving the compressor stations are
11 also shown. These volumes can be identified by the numbers
12 on the horizontal arrows immediately above the pipeline
13 diagram at the compressor station locations

14 Reference to the tabulation on the top of page 1
15 of this exhibit under the heading, "Design considerations"--

16 Q Design conditions, isn't it?

17 A Design conditions, shows that the total en route
18 deliveries from the project are 90 62 M² per day

19 I think it is of interest to point out that two
20 taps, namely Fresno with 55 and Bakersfield with 25 million
21 per day, account for 80 out of the total en route deliveries
22 of 90 million per day.

23 Q Would you locate those for us on the line?

24 A Referring to the left side of the flow diagram the
25 Fresno tap is the first tap that is on the downstream
26 side of the Kettleman compressor station and the Bakersfield

1 taps, namely the tap at Rosedale Junction and Union Avenue,
2 are the first tap that is shown on the upstream side of
3 the Kettleman compressor station.

4 Q Would you continue?

5 A On this flow diagram no deliveries are considered
6 to be made to the PG&E Company's service area supplied
7 from the Hollister tap or to the Bay and Stanpac mains at
8 Kettleman. No deliveries are considered to be made to
9 these taps for the reason, as in the case of Hollister,
10 gas can be routed into the area via the company's Bay line,
11 and in the case of the Bay and Stanpac mains idle capacity
12 north of the Kettleman field pipelines must be preferentially
13 used for delivering peak gas from the California
14 sources into the Northern California service area during
15 periods of peak firm demand

16 There will at times be deliveries to both of these
17 tap points and the range of the probable deliveries will
18 be as shown on the flow diagram

19 Q What other assumptions have been made in preparing
20 this flow diagram?

21 A Referring to the top of the flow diagram on page
22 1 a 90 degree gas temperature and July load requirements
23 are assumed in the Topock-Hinkley section of the pipeline,
24 and a 60 degree gas temperature in January load requirements
25 are assumed for the remainder of the pipeline.

26 Q Please tell us the reason for the choice of location

1 of the several connections of the proposed loop main
2 shown in red on this diagram on page 1?

3 A At the outset in determining the basic design
4 considerations for this capacity increase the Pacific Gas
5 and Electric Company's management considered it essential
6 to install the amount of loop main shown in the Kettleman
7 to Milpitas section, which is on the left side of the dia-
8 gram as a minimum reinforcement needed to protect its
9 San Francisco Bay service area against a loss of supply in
10 the event of a pipeline outage on the 34-inch pipeline.
11 Portions of the presently existing single pipeline traverse
12 the Panoche hill country where during winter the terrain
13 and the Bentonite type of soil seriously interferes with
14 line repairs.

15 The proposed dual pipeline will not only traverse
16 all the hill country between Kettleman and Milpitas but
17 also will provide further security to the company's major
18 load center north of Milpitas under line outage conditions
19 in that it will make the maximum draft potential of the
20 34-inch pipeline readily available to these load centers

21 Referring to the Topock-Hinkley section on the
22 right side of page 1 the 20 8 mile section of loop main
23 shown in red immediately downstream of the Topock compressor
24 station is located, as shown, to effect a dual pipeline
25 in hilly country where many open spans are required to
26 cross deep washes The company's portion of a second

1 crossing of the Colorado River is also to be installed
2 The crossing is to be a suspension type and while required
3 primarily as a security measure to protect the supply to
4 the Northern California area it does improve the suction
5 pressure conditions at the Topock station and as a result
6 saves horsepower and loop main that would otherwise be
7 required The other sections of loop main shown in red
8 were limited to the amount of second pipeline needed to
9 effect an 809 million per day delivery without increasing
10 the installed horsepower rating of the project.

11 Q Mr Pugh, would you turn now to page 2 and describe
12 what that page shows?

13 A Page 2 of this exhibit gives the conditions that
14 are affected in the several compressor stations on the
15 Topock to Milpitas pipeline with respect to suction and
16 discharge pressures, horsepower, station fuel requirements,
17 and other related data and pipeline receipts are 809
18 million cubic feet per day Many of the data comes from
19 the flow diagram on page 1

20 Referring to line 20 on page 2 it can be seen
21 that there will be no additional horsepower installed,
22 and the rate of the horsepower of the pipeline project
23 will remain as it presently is, namely 66,860 horsepower

24 Q That is at line 17, right?

25 A Yes. That can be seen by referring to the number
26 on line 17 in the last column on page 2

1 Q Would you turn now to page 3 and tell us the sig-
2 nificance of that page which describes the pressure
3 gradients?

4 A The upper graph on page 3 shows pressures along
5 the Topock to Milpitas pipeline for the 809 million per
6 day stage of delivery The graph assumes the pipeline
7 to be looped with an additional 129.10 miles of 34-inch
8 pipe.

9 The proposed loop facilities and their location are
10 indicated in red The graph shows the pressure gradient
11 along the pipeline for the delivery and the temperature
12 conditions tabulated on the flow diagram on page 1 of this
13 exhibit

14 The pressures shown on this graph -- the pressure
15 shown on this graph was calculated by the classical flow
16 equation, using the friction factor presently being
17 experienced, of 0.0023. Flow equation has been adjusted
18 for changes in elevation along the length of the pipeline

19 The lower curve on page 3 is the pipeline profile
20 used to obtain the changes in elevation along the pipeline

21 As can be noted, by referring to the Kettleman to
22 Milpitas section of the project on the right side of this
23 sheet, 87 million cubic feet of storage space is provided.

24 The difference in the pipeline inventory between
25 the pressure curve labelled, "Gradient with inventory" and
26 that labelled, "Open flow gradient" effects sufficient

1 change in inventory to obtain the 87 million cubic foot
2 storage. This amount of storage is required to balance
3 demand in the load centers with the volume of gas being
4 supplied by other pipelines

5 Q Would that storage of 87 million cubic feet serve
6 the same general purpose as holder storage?

7 A Yes, it does serve the same general purpose.

8 Q What is the largest above-ground holder on the system
9 of the Pacific Gas and Electric Company at the present time,
10 in point of capacity?

11 A The largest above-ground holder on the company's
12 system is presently 17 million cubic feet and there are
13 two on the system, one in San Francisco and one in Richmond

14 Q So the storage that will be provided in this line
15 of 87 million cubic feet is equivalent to a little more
16 than five of such 17 million cubic feet of above-ground
17 holders, is that correct?

18 A Yes, that is correct.

19 Q How does the cost of providing storage in a pipeline,
20 such as this one, compare with the cost of providing storage
21 in an above-ground holder?

22 A The cost of the pipeline storage, such as provided
23 in this project, is about 30 percent of the cost of above-
24 ground storage.

25 Q What is the yield strength of the proposed pipeline
26 to be installed?

1 That is referred to on page 3, I believe.

2 A. Yes, referring again to page 3, the note on the
3 upper left-hand side of the sheet shows that for the pro-
4 posed loop main to be installed the transverse yield
5 strength for all thickness of pipe is to be 52,000 pounds
6 per square inch compared to the transverse yield strength
7 of the pipe presently installed being downgraded for
8 wall thicknesses in excess of 3/8 inches

9 The specific wall thicknesses proposed for the
10 sections of loop main shown in red are as listed on page
11 4 of the exhibit testified to be Mr. Beckman, namely
12 Exhibit No SB-2

13 Q Would you turn, Mr. Pugh, to page 4 and just tell
14 us briefly what that shows?

15 A Page 4 lists the flow formula used for calculating
16 the necessary miles of loop main reinforcement to delivery
17 the 809 million cubic feet per day

18 I think the nomenclature for the formula is covered
19 by the text on page 4

20 Q Would you turn now to pages 5 and 6 and tell us
21 what they show?

22 A Pages 5 and 6 give a brief summary of the design
23 considerations for the proposed project and lists pipeline
24 specifications and the maximum working pressure for the
25 pipeline

26 Q What does the remainder of the exhibit show?

1 A The remainder of the exhibit shows for the 885
2 million stage of delivery similar data to that just dis-
3 cussed for the 809 million stage of delivery

4 The set of sheets covers the 885 million per day
5 delivery and shows the required facilities as an increment
6 above those for the 809 million per day delivery This can
7 be seen by referring to page 1 after the second fly sheet
8 where the 809 million per day facilities are shown in blue
9 and those proposed to increase the capacity to 885 million
10 per day are shown in red

11 Page 2 of this exhibit shows the compressor horsepower
12 and fuel requirements for the 885 million stage of delivery

13 Reference to line 21 on page 2 will show that a
14 total of 9,260 horsepower is to be installed This horse-
15 power will be made up of 5,000 horsepower at the Topock
16 station, 2500 horsepower at the Hinkley station, and 1760
17 horsepower at the Kettleman station.

18 The addition of the 9,260 horsepower will make the
19 total horsepower installation for the project equal to
20 76,120, which number can be seen by referring to line 17
21 under the total heading on this tabulation

22 Q Mr. Pugh, are all of the facts stated in this
23 exhibit true and correct, to the best of your knowledge
24 and belief?

25 A Yes, I believe they are.

26 Q And where estimates have been made or stated are

1 they reasonable estimates?

2 A Yes, they are.

3 MR. MORRISSEY: Mr. Examiner, may this document be
4 received in evidence?

5 EXAMINER EDWARDS Any objection to the receipt of
6 Exhibit SB-3?

7 (No response)

8 EXAMINER EDWARDS Apparently not None appearing,
9 Exhibit SB-3 is received.

10 MR. MORRISSEY: Mr Pugh, will you please specify what
11 facilities would be eliminated if the deliveries received
12 from El Paso should be reduced to 850 million cubic feet
13 per day?

14 A If the deliveries were reduced to 850 million cubic
15 feet per day the project proposed to deliver the 885 million
16 feet per day would be changed by the elimination of the
17 planned 2500 horsepower installation at the Hinkley
18 compressor station

19 This can be seen by reference to Exhibit SB-2
20 which Mr. Beckman just testified to be turning to page
21 1 opposite the second flysheet which describes the 885
22 million per day project, and the change in the planned
23 facilities to effect a delivery of only 850 million cubic
24 feet per day would be the elimination of the 2500 brake
25 horsepower shown in red, at the Hinkley compressor station

26 Q Will you please give us an approximate estimate of

1 the costs that would be eliminated by not constructing the
2 compressor at the Hinkley station?

3 A If that compressor were not installed there would be
4 a cost saving of approximately \$825,000 in the total
5 estimated costs shown on page 3 of Exhibit SB-2, and the
6 total estimated costs shown on page 3 of \$5,426,000 would
7 be reduced to a total of \$4,601,000.

8 EXAMINER EDWARDS: We will take a brief recess at this
9 time

10 MR. MORRISSEY: Yes That completes Mr Pugh's direct
11 testimony

12 EXAMINER EDWARDS: Very well. We will have a brief
13 recess.

14 (Recess taken)

15 EXAMINER EDWARDS: On the record. I understand there
16 are no questions for clarification of Mr. Pugh

17 Will you present your next witness, please, Mr
18 Morrissey

19 MR. MORRISSEY: Mr. Haavik.

20 S A HAAVIK, a S. L. A. HAAVIK
21 recalled DIRECT EXAMINATION resumed

22 MR. MORRISSEY: What is your present position, Mr Haavik?

23 THE WITNESS: My present position is that of Supervising
24 Gas Reserve Engineer in the Department of Gas Operations
25 of the company.

26 Q Have you previously testified in this proceeding

1 concerning the gas supply available to PG&E from California
2 Gas and Oil fields?

3 A Yes sir, I have.

4 MR. MORRISSEY. I might add that Mr. Haavik's last
5 testimony on this subject was given at the hearing on
6 August 14, 1953, which appears in the transcript beginning
7 at page 951.

8 In your testimony, the last time, Mr Haavik, you
9 stated that as of January 1, 1952 the remaining recoverable
10 reserve in the California gas and oil fields supplying PG&E
11 totaled 4,714 billion cubic feet of gas of which you
12 estimated the company would purchase 2,347 billion cubic
13 feet or 49.8 percent, is that correct?

14 A Yes sir, that is correct.

15 Q Do you have a more recent figure that you can give
16 us at this time?

17 A Yes, I do

18 Q Please give it

19 A As of January 1, 1954 I have estimated that the
20 remaining recoverable reserve of California gas in fields
21 supplying the Northern California companies was 5,100 billion
22 cubic feet of which I have estimated 2,539 billion cubic
23 feet or 49.8 percent would be available to the company

24 Q This would indicate, then, that there has been
25 a split increase in the estimate of the total remaining
26 reserve available to the Northern California companies

1 Is this increase true for California generally?

2 A No, it is not

3 Q Would you explain what the figures are for California
4 as a whole?

5 A As of January 1, 1952 the State Division of Oil
6 and Gas estimated the total remaining recoverable reserve
7 of California gas to be 9,535,000,000,000 cubic feet, while
8 as of January 1, 1954 the same agency estimated the total
9 recoverable reserve to be 8,923,000,000,000 cubic feet,
10 which represents a decline in the 2-year period of
11 612,000,000,000 cubic feet

12 Q Do you have any more recent estimates with reference
13 to remaining recoverable reserves in California, other
14 than those which you have just given?

15 A Yes sir, I do. As of January 1, 1955 the State
16 Division of Oil and Gas has estimated the total recover-
17 able reserve of gas to be 8,703,000,000,000 cubic feet,
18 or a further decline during the 1-year period of
19 220,000,000,000 cubic feet. As of the same date the
20 American Gas Association estimated the total recoverable
21 reserve of California natural gas to be 9,027,000,000,000
22 cubic feet

23 Q Do you have in front of you a copy of Exhibit No.
24 SB-4 which has been identified?

25 A Yes sir, I do

26 Q What is that entitled?

1 A Exhibit No SB-4, for identification, is entitled,
2 "Forecast of maximum daily rates of availability of gas
3 supply to Northern California companies."

4 Q Did you prepare that exhibit?

5 A Yes sir, I did.

6 Q Which of the Northern California companies?

7 A The Northern California companies are the Pacific
8 Gas and Electric Company and the oil companies and a
9 chemical company conducting refinery and chemical plant
10 operations in Contra Costa County, and these include
11 Standard Oil Company of California, the Shell Oil Company,
12 Tidewater Associated Oil Company, Union Oil Company of
13 California, and the Dow Chemical Company.

14 Q Will you please turn now to page 1 of that
15 exhibit and tell us what that page shows?

16 A Page 1 of the exhibit shows with details by fields
17 the estimated maximum daily rates of availability of gas
18 supply for the combined Northern California companies for
19 winter seasons commencing with that of 1955-'56 and ending
20 with 1960-'61.

21 The tabulation shows the estimated maximum daily,
22 rates of availability from field sources grouped into
23 producing areas and segregated as to dry gas and oil well
24 gas.

25 The Northern and Central California dry gas fields
26 are totaled at line 35, and the San Joaquin Valley dry gas

1 fields are totaled at line 46.

2 Line 47 shows the total maximum rate of availability
3 of dry gas

4 Q What do the figures show as to the increase or
5 decrease in the maximum daily rates of availability of
6 dry gas for the next five years?

7 A The figures show at line 47 the maximum daily rate
8 of availability of dry gas declining from 698 3 million
9 cubic feet a day in the winter of 1955-'56 to 535 5
10 million cubic feet a day in the winter 1960-'61

11 Q Refer now to line 62 which shows the total oil
12 well gas maximum daily rates of availability and please
13 tell us whether there is also a decline expected in the
14 maximum daily rates of availability of that type of gas?

15 A As indicated at line 62 the estimated decline in
16 the maximum rate of availability of oil well gas is moder-
17 ate for the period shown The estimated maximum rate of
18 availability of oil well gas is shown on line 62, as shown
19 on line 62 is expected to decline from 116.7 million cubic
20 feet a day in the winter 1955-'56 to 110.7 million cubic
21 feet a day in the winter 1960-'61

22 Q What other sources of California gas supply are shown
23 on this page?

24 A In addition to the dry and oil well gas sources I
25 have shown the supply estimated to be available from under-
26 ground storage in line 63, emergency oil well gas, line 64,

1 and standby plants at line 67.

2 Q How have you shown the out-of-state gas?

3 A. The presently certified out-of-state rate of reply
4 of 700 million cubic feet a day gross at 14 9 pressure
5 base and 100 percent load factor is shown on line 69
6 adjusted for pressure base, and to exclude compressor
7 fuel. The proposed increase of 100 million^a day from 700
8 to 800 million a day in the out-of-state rate in two
9 increments of 50 million a day each on November 1, 1956
10 and November 1, 1957 is shown adjusted for pressure base
11 and to exclude compressor fuel on line 73

12 Q Do the rates shown for underground storage on line
13 63 reflect your present thinking at this time?

14 A. No, sir. Our progress in the development of the
15 underground storage project has not been as rapid as
16 anticipated when this exhibit was prepared.

17 Q Should not this tabulation then be corrected to
18 reflect the delay in the development of the storage facility?

19 A Yes, sir. Corrections on this page should be made
20 in the column for the winter season 1956-'57, as follows:

21 At line 63 change 40 0 to zero. At line 66 change
22 941.8 to 901 8 At line 68 change 1069.2 to 1029.2. At
23 line 70 change 1764.1 to 1724.1. And at line 74 change
24 1814.3 to 1774 3

25 Q Except for the correction made in line 64 all of
26 the other changes are resulting changes as a result of the

1 correction on line 64, or rather 63, is that correct?

2 A Yes, sir, line 63.

3 Q Are there any other corrections for this page?

4 A No, sir

5 Q Now, Mr. Haavik, I will ask you to please turn to
6 page 2 of this exhibit and tell us what that tabulation
7 shows?

8 A The tabulation shown at page 2 of the exhibit is
9 similar to that on page 1 but includes estimates for an
10 additional winter season 1961-'62.

11 Q Is the detail on this page 2 excluding the winter
12 1961-'62 identical with that shown on page 1?

13 A Yes, sir Down to and including line 68

14 Q How has the out-of-state gas been shown on this page?

15 A The proposed out-of-state rate of supply of
16 800 million a day is shown on line 70 adjusted for pressure
17 base and to exclude compressor fuel. It is the sum of
18 those rates shown on lines 69 and 73 of page 1

19 Line 73 on this page shows the proposed further or
20 additional increase of 75 million a day from 800 to 875
21 million a day in the out-of-state rate in three increments
22 of 25 million a day each on November 1, 1957, January 1,
23 1958, and January 1, 1959 adjusted for pressure base and
24 to exclude compressor fuel.

25 The first increment of 25 million a day is coincident
26 with the second 50 million a day increment in the 800 million

1 a day project.

2 Two of the three 25 million a day increments are shown
3 in the column for the 1957-'58 winter

4 Q Should this tabulation also be corrected to reflect
5 the delay in the underground storage development?

6 A. Yes, sir Corrections on this page 2 should again
7 be made in the column for the winter season 1956-'57, as
8 follows.

9 Line 63, change 40.0 to zero Line 66, change
10 941 8 to 901 8. At line 68 change 1069.2 to 1029 2
11 At line 71 change 1814 3 to 1774 3 And at line 74
12 change 1814 3 to 1774 3.

13 Q Referring now, Mr. Haavik, to proposed Exhibit
14 No SB-5, which is entitled, on the outside cover,
15 "Summarized recapitulation of maximum daily rates of
16 availability of gas supply to Northern California companies."

17 I would like to ask you first whether you prepared
18 this recapitulation?

19 A. Yes, sir, I did

20 Q Now, refer to it and tell us what your figures show
21 with respect to the maximum daily rates of availability of
22 gas supply for future years?

23 A The figures at line 6 which include the regular
24 and emergency field sources as well as the present standby
25 plant capacity show a constant decline during the six-year
26 period from 1056 4 million cubic feet a day in the winter

1 1955-'56 to 853 7 million cubic feet a day in the winter
2 1961-'62.

3 The indicated reduction during the six-year period
4 amounts to 202 7 million cubic feet a day

5 Q What is the effect of the introduction of under-
6 ground storage on this reduction?

7 A The effect of the introduction of underground
8 storage at the rate of 80 million a day in the winter
9 1957-'58, as shown on line 7, reflects on the total
10 California gas as shown on line 8 The reduction of
11 202.7 million cubic feet a day indicated on line 6 is
12 thereby reduced to an indicated reduction of 122 7
13 million cubic feet a day, the difference between 1056⁶4 in
14 1955-'56 and 1933 7 from line 8 in the winter 1961-'62.

15 Q What is the effect of the expected increases in
16 the amount of out-of-state gas supply on this reduction?

17 A The effect of the expected increases in the out-
18 of-state supply of gas, as shown at lines 11 and 13,
19 amounts to a total of 177.3 million cubic feet a day,
20 which is the sum of 99 7 from line 11 and 77 6 from line
21 13

22 Q And what is the net effect of this reduction in
23 California production and these expected increases on the
24 total supply for the system?

25 A The net effect is shown at line 14 and amounts to
26 an increase of 54.6 million a day during the six-year

1 period representing the difference between 1751 3 million
2 a day in the winter 1955-'56 and 1805 9 million a day in
3 the winter 1961-'62.

4 Q Now, Mr. Haavik, are the figures, facts given in
5 Exhibits SB-4 and SB-5 true and correct, to the best of
6 your knowledge and belief?

7 A Yes, sir.

8 Q And where estimates have been made in these
9 exhibits are they reasonable estimates?

10 A Yes, sir

11 MR. MORRISSEY: Mr Examiner, may these exhibits be
12 received in evidence?

13 EXAMINER EDWARDS Any objection to receipt of Exhibits
14 4 and 5?

15 (No response)

16 EXAMINER EDWARDS: None appearing, Exhibits 4 and 5 are
17 received.

18 MR. MORRISSEY. And does that complete your direct
19 testimony on gas supply, Mr Haavik?

20 A Yes, sir, it does

21 MR. MORRISSEY If there are no questions for clarification
22 at this time I would like to call my next witness

23 MR. BECK: No questions for clarification

24 EXAMINER EDWARDS: Very well You may stand aside.

25 MR. MORRISSEY I would like to call Mr Ellis.
26

J. W. ELLIS

recalled DIRECT EXAMINATION resumed

MR MORRISSEY: What is your present position, Mr. Ellis, in the Pacific Gas and Electric Company?

A I am a Senior Engineer in the Valuation Department

Q Did you prepare exhibit, proposed Exhibit No. SB-6, entitled, "Northern California Natural gas requirements and relationship to supply"?

A That was prepared under my direction. I am responsible for the figures in it.

Q What is the purpose of this exhibit?

A. The purpose of the exhibit is to develop the requirements for future years 1955 to '61, inclusive, and to compare them with the requirements -- compare those requirements with the supply that is available, see if there is need for more gas in Northern California than presently certified from the out-of-state supply.

Q Now, would you please refer to page 1 of that exhibit, which is entitled, "Summary of annual natural gas requirements," and describe what is shown on that page?

A This page 1 shows the three last actual years 1952, '53 and '54 and forecast years 1955 through 1961, inclusive, firm requirements, interruptible requirements and total requirements broken down by classes of service.

On line number 9 the daily average firm requirements are shown, and on line number 23 the daily average interruptible

1 requirements are shown

2 Line 25 showing the total daily average requirements,
3 that is the firm and the interruptible added together

4 Q And what is indicated as to the growth?

5 A On line 9 it indicates that the firm requirements
6 will grow from an average daily amount in 1954 of 485
7 million cubic feet per day to 633 million cubic feet per
8 day in 1961. And at line 23 the growth of total interrupt-
9 ible requirements is from an average daily amount of 461
10 million cubic feet per day in 1954 to 605 million cubic
11 feet per day in 1961.

12 On line 25 the total requirements show a growth from
13 946 million feet a day in 1954 to 1,238 million cubic feet
14 per day in 1961

15 Q Would you turn now to page 2 and tell us what that
16 page shows?

17 A Page 2 shows the relationship of the Northern
18 California natural gas requirements to the supply in
19 millions of cubic feet on an average daily basis

20 The first three columns at the top of page 2 are
21 figures transferred from lines 9, 23 and 25, respectively,
22 on page 1

23 The other companies' requirement shown in column
24 4 are requirements of the four oil companies and one chem-
25 ical company which have their own gas supply.

26 Columns 5 and 6 show the injection into the Pleasant

1 Creek storage for the two supplies of 708.1 and 809.2
2 millions of cubic feet per day

3 Columns 7 and 8 show the total Northern California
4 requirements with the two respective supplies of out-of-
5 state gas

6 The bottom half of page 2 shows the comparison of
7 the forecast requirements with the supply available First
8 for the 700 million cubic feet per day available from
9 out-of-state, and second, the 809.2 million cubic feet
10 per day out of state The amount of deficiency from the
11 708.1 supply of out-of-state gas is shown in column 12 and
12 for the 809.2 million cubic per day of out-of-state supply
13 in column 16

14 Q Now, turn to the next page, page 2-A, and tell us
15 how that supplements page 2

16 A Page 2-A shows the same type of information as shown
17 on page 2, except that we have two different supplies; the
18 809.2 million feet a day on the left-hand side of the
19 sheet at the lower portion of the table is the same as in
20 page 2, and that is compared with the out-of-state supply
21 of 885.1 million feet a day at the lower right-hand portion
22 of the table

23 Q Now, turn to page 3, which sets forth the relation-
24 ship of Northern California natural gas requirements to
25 supply based on an abnormal peak day and describe these
26 figures briefly

1 A The table is set up in two parts

2 The upper half of the table shows the development
3 of the peak, abnormal peak day requirements, and the lower
4 half shows the relationship of those requirements to the
5 supply

6 Referring to the upper portion of the table, the
7 winter seasons are shown historically from 1950-'51 to
8 1954-'55 and the forecast data is shown below it for the
9 winter seasons '55-'56 to 1961-'62

10 Column 1 shows the average daily firm requirements

11 Now, for the historical section, column 3 shows
12 firm requirements on abnormal peak day bases From that,
13 dividing column 3 by column 1, the historical ratios of
14 peak to average daily were developed as shown in column

15 2 Those five ratios were averaged to show the ratio
16 for the forecast period and amounts to 2.95 The require-
17 ments in column 3, then, for the forecast period were
18 developed from the average daily figures shown in column
19 1 by multiplying by 2 95.

20 To this forecast requirement in column 3 we then
21 added the item shown in column 4 which is interruptible
22 service not promptly curtailable That gave then a total
23 shown in column 5 To that was added the requirements of
24 the other companies, that is, the oil companies and the
25 chemical company, giving a total -- strike that last part,
26 please.

1 Q What is column 7 which is entitled, "System oper-
2 ating tolerance"? What is meant by operating tolerance?

3 A The supply that we are going to compare these
4 requirements with contemplates a maximum available supply
5 with all wells and transmission and other facilities oper-
6 ating at 100 percent capacity It isn't always possible
7 to keep such a condition, and to allow for the fact why
8 we have used these operating tolerances shown here

9 Q I see Would you continue now with your description?

10 A The total Northern California company requirements
11 in column 8 are the sum of columns 5, 6 and 7

12 The forecast -- turning now to the lower half of
13 the table, forecast requirements of column 8 have been
14 repeated in column 9 for convenience. And then they are
15 compared with the total supply available, which is shown
16 in column 10, for the 708 1 supply of out-of-state gas,
17 giving then a deficiency in column 11 for the years beginn-
18 ing with 1958-'59

19 Q Now, is there a correction which you would like to
20 make in columns 10 and 12 entitled, "Supply"?

21 A In line with the testimony just given by Mr Haavik
22 I should reduce that 1956-'57 supply by 40 million a day
23 Instead of having 1764 millions of cubic feet it should be
24 1724.

25 MR. MORRISSEY May the correction be made, Mr. Examiner?

26 EXAMINER EDWARDS: It has been made on the official copy.

1 THE WITNESS: While we are about that correction I
2 should call attention to column 12 and for the same winter
3 '56-'57 the eighteen-forteen should be reduced to seventeen-
4 seventy-four.

5 MR. MORRISSEY: And that is indicated there, is it not,
6 on page 3-A also, the next page?

7 A Yes.

8 EXAMINER EDWARDS: That change will be made

9 MR. MORRISSEY. Did you describe columns 11 and 13?

10 A They are the deficiencies in supply on abnormal
11 peak day, and it will be noted that with the 708 1 supply
12 from out of state the first deficiency occurs in 1958-'59
13 and with that 809.2 out-of-state supply the first deficiency
14 shows up in 1959-'60.

15 Q Now, does page 3-A following page 3 supplement page
16 3 in the same manner as page 2-A supplemented page 2?

17 A Yes, sir.

18 Q Now, would you turn to page 4 and 4-a and briefly
19 tell us what these graphs which are entitled, "Northern
20 California average daily use requirements" show?

21 A Pages 4 and 4-a shown on an average daily basis in
22 graphical form -- pages 4 and 4-A show on an average daily
23 basis in graphical form the basic data shown on pages 2
24 and 2-A respectively with some additional data from the
25 working papers with respect to the breakdown of the supply.

26 Q Will you turn now to page 5 and 5-A and describe

1 what those graphs show, which are entitled, "Northern
2 California abnormal peak day supply and requirements"?

3 A Similarly, these graphs show pictorially the
4 relationships between supply and requirements from pages
5 3 and 3-A.

6 There is some breakdown of the supply which is
7 developed from working papers

8 Q And what does page 6 show?

9 A That shows a summary of the number of average natural
10 gas customers by classes of service on the Pacific Gas
11 and Electric Company's system.

12 Q And what does page 7 show?

13 A Page 7 shows the names and addresses of the resale
14 natural gas customers of Pacific Gas and Electric Company.

15 Q And page 8 is a detailed breakdown of the number of
16 retail customers of PG&E's four natural gas resale accounts,
17 is that correct?/

18 A Yes.

19 Q And what do pages 9 and 9-A show?

20 A These two pages show the requirements, the curtail-
21 ments and sales first of the interruptible industrial
22 customers and second the company's steam electric plants
23 with supplies of 708.1, 809 2 and 885 1 millions of cubic
24 feet per day from out of state.

25 Q Now, what do pages 10 and 10_A show?

26 A Pages 10 and 10-A show in similar fashion the steam

1 heat plant requirements and the gas plant requirements of
2 the Pacific Gas and Electric Company.

3 Q And what do pages 11 and 11-A show?

4 A Pages 11 and 11-A show for the three respective
5 out-of-state supplies of natural gas the total requirements
6 developed on page 1, line 24, and the underground storage
7 injection, and the Topock line compressor fuel Those
8 three items added together give the total requirements.

9 Then below that is shown the firm deficiencies and
10 the curtailments. Those are deducted from the requirements,
11 being deducted from the requirements leave the amount of
12 send-out

13 Q Send-out of what?

14 A Send-out of natural gas for the Pacific Gas and
15 Electric Company's system.

16 Q Do the statements contained on pages 12 and 13
17 present detailed explanations of the basic factors which
18 you used in making estimates of future requirements?

19 A Yes, they do

20 Q Is there anything in particular which you would
21 like to call to the attention of the Commission with
22 respect to this matter?

23 A Yes I think I should state at this time that
24 the forecast shown in this exhibit does not include the
25 Trona extension in San Bernardino County To that extent
26 at least these estimates are conservative

1 Q Are the facts as given in this exhibit true and
2 correct to the best of your knowledge and belief?

3 A Yes, sir.

4 Q And where estimates have been made are they
5 reasonable estimates, Mr. Ellis?

6 A I think so

7 MR. MORRISSEY. Mr. Examiner, may SB-6 be received in
8 evidence, please?

9 EXAMINER EDWARDS Any objection to the receipt of this
10 document?

11 (No response)

12 EXAMINER EDWARDS: None appearing, Exhibit SB-6 is
13 received

14 MR. MORRISSEY That completes Mr. Ellis' direct
15 testimony

16 EXAMINER EDWARDS: Any clarification?

17 MR BECK: I have a question

18 EXAMINER EDWARDS: Mr. Beck.

19 QUESTIONS FOR CLARIFICATION

20 MR. BECK: Mr. Ellis, on page 3 of your exhibit you
21 made a correction there of underground storage your '56-'57
22 where you reduced that from seventeen sixty-four to seven-
23 teen twenty-four?

24 A That is in column 10 for the 708.1 supply?

25 Q Yes, on page 3-A, did you make the correction there
26 also?

1 A Yes

2 Q Did you state it?

3 A Yes

4 MR. MORRISSEY: I believe the Examiner got that correct-
5 ion.

6 EXAMINER EDWARDS: Counsel referred to it and I noted it.

7 MR. BECK. I missed that one

8 Now, referring to page 2-A, aren't the requirements
9 there for storage injection changed by the fact that there
10 is no underground storage for the first year?

11 A Yes, sir There would be a small change.

12 Q But it wouldn't change the figures much, though?
13 You just neglected it?

14 A It is a very small amount, that is right.

15 Q There is one more thing that I seem to have slipped
16 up on here Would you please to page 3 again I notice
17 that in the first column number 1 for the three -- in the
18 first column number 1, for the year 1953-'54 you show
19 average daily firm requirement of 464 millions of cubic
20 feet Now, under the average daily requirements on page
21 2-A I see a different figure there. I don't quite recon-
22 cile that

23 A Yes. On page 1 I show 485 million average firm
24 daily requirement

25 Q Yes.

26 A And for the '53-'54 I show four sixty-four

1 Q Yes.

2 A I neglected, I think, to state that that is an
3 average temperature basis on page 3 in column 1 when I
4 was describing the table, and that is the difference. It
5 is a temporary adjustment.

6 Q I see In other words under the average daily that
7 is just the actual, is that correct?

8 A Maybe I was referring to the wrong year here now,
9 Mr. Beck.

10 I should compare that four eighty-five in column
11 3 on page 1 with the '54-'55 winter on an average temper-
12 ature basis in column 1 and on page 3. I got it on the
13 wrong line I was on the wrong line

14 Q In other words, then --

15 A The four eighty-five compares with the four ninety-
16 three.

17 Q Yes And the reason why you increased that to
18 four ninety-three was that the normal year '54 was warmer
19 than the average year, temperature year? There is an
20 increase there?

21 A The actual was warmer, yes

22 MR. BECK. Thank you That is all.

23 EXAMINER EDWARDS: Any other questions at this time?

24 MR. RIVES: There is just one minor matter.

25 Mr Ellis, referring to pages 5 and 5-A, which are
26 graphs?

1 A Yes, sir.

2 Q Did you catch that same elimination of allowance for
3 underground storage for 1956-'57 on those two graphs in
4 your testimony?

5 A I did not and should have mentioned it I should
6 have mentioned that these are drawn with the forty million
7 a day underground storage included.

8 Q So your curve for underground storage would really
9 start at the '56-'57 line -- no -- I guess it would be
10 at the '57-'58 lines?

11 A That is right, yes, and it would be a zero amount
12 there in '56-'57 if the graph were corrected

13 EXAMINER EDWARDS: That is what mine shows

14 MR. RIVES Maybe I have misread it I was looking
15 at the space rather than the line

16 MR. MORRISSEY: Mr. Ellis, at what points, when you
17 drew this graph, did you put in figures?

18 In other words, is the space significant or is the
19 distance between the two or three lines indicated on the
20 graph at the points where the vertical lines are, namely
21 the lines that are identified as '55-'56 or '56-'57, and
22 so on? In other words, is it not true that the line join-
23 ing the two or more vertical lines is merely an interpola-
24 tion?

25 A I am not sure that I understand your question, but
26 maybe I can explain what we plotted here.

1 Q All right. That is what I want, yes

2 A. The amounts are plotted on the vertical lines
3 indicating the winter season, so when we come to the winter
4 '56-'57 we have a space represented there above the
5 certificated out-of-state gas. There is 40 million a day
6 shown representing underground storage. It is plotted
7 at the line, the vertical line representing that '56-'57.
8 Then when we came to the '57-'58 we have 80 million a day
9 distance along that line. So the underground storage
10 labeled is labeled in that space in between there, and
11 I think you can consider the space represents the amount
12 of each of these items as indicated by the titles on them

13 For instance, starting down at the bottom you have
14 regular California gas, and while we plotted the amounts
15 on the vertical lines you can consider those spaces down
16 there as being the amount of California gas.

17 MR. MORRISSEY: Is that a satisfactory explanation,
18 Mr. Rives?

19 MR. RIVES: Yes.

20 Would you not, if you replotted this with that 40
21 million eliminated for the winter of '56-'57, start your
22 line at the '56-'57 instead of starting it at '55-'56 and
23 take it up to the point where it was 80 million above the
24 line for additional out-of-state gas, and by the time it
25 gets to '57-'58, in other words it would be a steeper line
26 drawn between '56-'57 and '57-'58 in place of the less

1 steep line drawn between '55-'56 and '57-'58?

2 A I think you are absolutely right. That is the way
3 it would be.

4 EXAMINER EDWARDS: Well, gentlemen, the time for the
5 noon recess has arrived

6 Now, what is your pleasure?

7 MR. MORRISSEY: Well, I think, Mr. Examiner, it would
8 be well if we came back as quickly as possible and continued.

9 MR. BECK That is satisfactory

10 EXAMINER EDWARDS: Suggest a time.

11 MR. MORRISSEY: 1:00 o'clock, 1 15.

12 EXAMINER EDWARDS I think 1:15 is best. We will now
13 recess for the lunch hour until 1.15 p.m.

14 (Whereupon, at the hour of 12:00 noon, the Commission
15 recessed until 1 15 p.m)

16 * * * * *

1 AFTERNOON SESSION: 1,15 P.M.

2 * * * * *

3 EXAMINER EDWARDS The Commission will be in order.

4 Were there any other questions for clarification
5 of Mr. Ellis?

6 MR. BECK Just one, and I can finish it right up and
7 then I am through.

8 EXAMINER EDWARDS Mr. Ellis.

9 J. W. ELLIS

10 QUESTIONS FOR CLARIFICATION resumed

11 MR. BECK Mr Ellis, you show a normal peak day. Now,
12 in your estimates for all the following years do you include
13 at least one of those peak days in your calculations?

14 A No, not in determining the average day, if that is
15 what you mean

16 Q That is what I was talking about.

17 A This abnormal peak day may occur at any time, but
18 does not necessarily have to occur in any year

19 MR. BECK: That is all

20 EXAMINER EDWARDS Anything further?

21 MR RIVES Well, the abnormal peak day that you have
22 used here, Mr. Ellis, as I understand it, is expressed in
23 terms of a ratio to average which you develop by taking
24 historical experience for the last five years, is that
25 correct?

26 A Yes

1 Q In other words, sometimes in an abnormal peak day,
2 sometimes an abnormal peak day is taken as a certain mean
3 temperature, expressed in terms of minimum temperature
4 You have not done that in this case?

5 A Maybe my answer wasn't proper to your first question
6 there

7 This five years of experience here has been extrap-
8 olated to the 29.1 degrees Fahrenheit by drawing a graph
9 of winter days, each winter, and extrapolating to 29.1,
10 which is the design temperature representing the coldest
11 day we have experienced since we have been in the natural
12 gas business So when you ask me if they were historical,
13 they are to the extent that they are based on the historical
14 winter peak firm days that have been experienced

15 Q Well, referring to page 3 of your Exhibit SB-6 you
16 show in the first column the average daily requirements,
17 average daily firm requirements adjusted to an average
18 temperature basis

19 A Yes.

20 Q What days did you average the experience for to get
21 the figures shown for the historical winter seasons '50,
22 '51 through '54 and '55?

23 A Are you referring to the figures there in column 3?

24 Q No. I am referring first to the figures in column 1,
25 which are the average daily firm requirements

26 A Those are, for instance for this winter season '50-'51,

1 that represents the temperature adjusted average daily
2 firm requirement for the year 1950

3 Q For the entire year 1950?

4 A Yes sir.

5 Q And do the other figures represent the average
6 daily temperature adjusted requirements for the full year
7 of the first two years shown in the season, that is,
8 1951 and 1952 is the average for 1951, and so forth?

9 A Yes, that is right.

10 Q Then, in determining the figures in column 2,
11 ratio of peak to average daily, did you use an actual
12 experience peak or was there some adjustment for temper-
13 ature there?

14 A The figures in column 3 are the temperature adjusted,
15 you might say, actual winter peak day firm requirements
16 The actual experienced firm demands for winter days in
17 the winter seasons indicated have been plotted and
18 against the temperatures, or the degree days, as the
19 case may be, and extrapolated to find what they would have
20 been had the temperature been 29 1 degrees Fahrenheit,
21 the system composite temperature

22 Q So then you adjusted the peak day to 29 1, mean
23 average temperature for that day?

24 A Yes

25 Q Column 3 I think you said was a product of column 1
26 times column 2?

1 A Well, there is for the forecast -- yes, it is for
2 the forecast years. In the historic section there the
3 ratio is the derived figure

4 Q And column 3, then, represents the actual peak day
5 firm requirements adjusted to 29 1 temperature?

6 A Yes, that is right

7 MR. RIVES Thank you

8 EXAMINER EDWARDS Any other questions now?

9 (No response)

10 EXAMINER EDWARDS Apparently not You may stand aside,
11 sir

12 MR. MORRISSEY Call Mr Moulton

13 J. S. MOULTON

14 recalled DIRECT EXAMINATION resumed

15 MR. MORRISSEY: What is your present position with the
16 company, Mr. Moulton?

17 THE WITNESS Vice President and Executive Engineer.

18 Q Have you read the amended Third Supplemental
19 Application No. 29548, which is the subject of the hearing
20 today?

21 A I have.

22 Q And are the statements in that application correct,
23 to the best of your knowledge and belief?

24 A They are

25 Q And the requirements reasonable where estimates have
26 been made?

1 A I believe they are.

2 Q Do you have a copy of the exhibit, proposed Exhibit
3 entitled, "Cost of gas delivered from the Topock-Milpitas
4 pipeline, with proposed facilities added"?

5 A I do.

6 Q Was this exhibit prepared under your direction?

7 A It was.

8 Q What was the average field cost per Mcf for the
9 most recent year for gas obtained by PG&E from California
10 sources?

11 A For 1954 that cost, excluding the gas purchased
12 by Coast Counties prior to its merger with PG&E, was 24 045
13 cents per Mcf.

14 Q What is your estimate of the average field cost
15 per Mcf for gas to be obtained by PG&E from California
16 sources for the year 1955?

17 A For the first nine months that average price
18 actually was 24.117 cents per Mcf, or substantially the
19 same as the 1954 cost

20 Recently the price of fuel oil at refinery was
21 increased 15 cents per barrel, which had the effect of
22 increasing the price that we paid for gas from a number
23 of sources because of escalator clauses in the gas purchase
24 contracts. Reflecting that increase since it has become
25 effective the estimated average cost for gas purchased
26 for the calendar year 1955 is 24 437 cents per Mcf.

1 Q Will you please describe PG&E's existing contract-
2 ual obligations to take and rights to receive out-of-state
3 gas?

4 A PG&E's existing rights as to the purchase of out-
5 of-state gas are covered by a service agreement between
6 El Paso Natural Gas Company and Pacific Gas and Electric
7 Company, dated October 1, 1953. A copy of that agreement
8 is on file with this Commission in connection with the
9 Second Supplement of Application 29548, having been
10 furnished by letter to the Commission dated February 2,
11 1954. That agreement is also on file with the Federal
12 Power Commission. It provides that El Paso will furnish
13 on request of Pacific Gas and Electric Company a so-called
14 maximum contracted daily demand of 700 million cubic feet
15 on a 14 9 pound pressure base. PG&E is obligated to take
16 on an annual basis a minimum of 91 percent of that
17 quantity subject to some further reduction in the case of
18 certain eventualities, such as El Paso not delivering
19 gas up to the contracted daily demand when requested to
20 do so by Pacific or offering gas of a quality inferior
21 to that received in the contract.

22 Those two possible deductions are provided for
23 in the service agreement, but have not in fact actually
24 occurred during the period of time we have been purchas-
25 ing from El Paso.

26 Unless you want me to go into other details of the

1 agreement I think that is the essential part of it.

2 Q I think it is on file with the Commission and is
3 I think well known and can be easily referred to.

4 It won't be necessary unless the parties have some
5 questions later.

6 Now, would you turn, Mr Moulton, to the letter
7 agreements of July 8, 1954 and May 2, 1955 between El
8 Paso and PG&E?

9 These letter agreements, Exhibits A and B attached
10 to the Third Supplemental Application 29548, are for the
11 convenience of the parties here today and for the
12 Commission set out as separate documents as proposed
13 Exhibits Nos. 8 and 9. Would you describe those letter
14 agreements?

15 A Exhibit SB-8 is a copy of a letter agreement
16 between El Paso Natural Gas Company and Pacific Gas and
17 Electric Company dated July 8, 1954 It provides that
18 subject to the conditions contained in the agreement
19 that El Paso will sell to Pacific Gas and Electric
20 Company an additional maximum quantity of 100 million
21 cubic feet per day with delivery of the first 50 million
22 cubic feet to commence by November 1, 1956, and the full
23 100 million per day by November 1, 1957

24 It provides that El Paso will use its best efforts
25 to deliver, and Pacific Gas and Electric Company will use
26 its best efforts to take whatever additional gas El Paso

1 may have available prior to those delivery dates.

2 The second letter agreement which is dated May 2nd,
3 1955, and is contained in Exhibit SB-9, provides that
4 El Paso will deliver and Pacific Gas and Electric Company
5 will purchase an additional maximum daily quantity of
6 125 million cubic feet per day, with the delivery of the
7 first 25 million to commence by November 1, 1957

8 I might say, parenthetically, that that is the
9 same date as the second 50 million block in the letter
10 agreement of July 8, 1954

11 Then, the letter of May 2, 1955 provides that the
12 second 25 million is to commence by January 1, 1958, and
13 the balance of the 125 million by January 1, 1959

14 I might say that in explanation of that balance
15 of 125 million that the El Paso Company found that as of
16 a recent date it believed that it had gas supply only
17 sufficient to deliver 75 million of that last block,
18 rather than the 125 million, and that is the reason that
19 the applications pending before the Federal Power
20 Commission, as well as this application pending before
21 this Commission, cover a total of only 175 million, made
22 up of the 100 million covered by the July 8, 1954 agree-
23 ment and 75 million of the 125 million covered by the
24 May 2, 1955 agreement

25 Q Now, would you refer back to the Exhibit No SB-7,
26 cost of gas delivered from Topock-Milpitas pipeline with

1 proposed facilities added, and describe briefly that
2 exhibit for us?

3 A This exhibit consists of two pages

4 On the first page in the first column of figures
5 headed, "Daily delivery at Topock in M²cf," and the
6 column heading of 708, that column shows the cost of
7 plant plus working capital, the annual deliveries of
8 gas corresponding to 700 million cubic feet per day at
9 91 percent annual load factor, and the cost of that
10 gas at Topock at the present El Paso rate which is in
11 effect. That rate is subject to refund if the Federal
12 Power Commission in a rate case now pending before it
13 should, when it decides that case, fix a lower rate
14 than that now in effect That rate now in effect and,
15 as I say, subject to refund, is \$2 per month per Mcf of
16 certificated maximum demand, plus 18 cents per Mcf Those
17 rates apply to gas on a 14 9 pound pressure base.

18 This might be a good point to explain that our
19 agreement with El Paso covers gas at a 14 9 pound
20 pressure base, while the standard base used in California
21 is 14.73 pounds So the rough conversion is 700 million
22 on a 14 9 pound base when we customarily talk about, when
23 we refer to the El Paso agreement, and 708 million on
24 a 14 73 pound pressure base, which is the pressure base
25 used in the column headings in this exhibit, and I noticed
26 from looking at the exhibits submitted earlier by other

1 witnesses for the company in this hearing, they have
2 customarily used the 14.73 pound pressure base. I make
3 that explanation if anyone reading the record or looking
4 at the exhibit should be confused as to why sometimes I
5 might talk about a 700 million per day purchased from
6 El Paso and the exhibit will show 708 million. They are
7 actually the same quantity of gas but expressed only on
8 two different pressure bases.

9 With that interpolation, I return to the explanation
10 of the first column of figures on page 1 of Exhibit
11 SB-7 to say that the transport costs are based on actual
12 company costs adjusted to present conditions where
13 necessary and with allocations to the Topock line where
14 such allocations are required.

15 This column shows that the average cost of gas at
16 Topock adjusted to a 14.73 pressure base and a 91 percent
17 load factor is 24.938 cents per Mcf, that the average
18 transportation cost per Mcf, assuming that all of that
19 gas is transported from Topock to Milpitas at the south
20 end of San Francisco Bay, is 7.351 cents per Mcf. The
21 sum of those two figures makes the total delivered cost
22 of gas at Milpitas 32.289 cents.

23 The second column of figures headed, "101" repre-
24 sents the investment, and the other figures corresponding
25 to an additional delivery of 100 million cubic feet per
26 day. The cost of gas at Topock per Mcf is of course the

1 same as for the 700 million The transport cost from
2 Topock to Milpitas is 7.406 cents, making the delivered
3 cost at Milpitas 32.544 cents

4 The third column represents the total or computed
5 average unit costs of the 809 million cubic feet delivered
6 at Milpitas, as stated, on a 14.73 pressure base. That
7 delivered cost is 32.296 cents.

8 Now, if you will refer to page 2 of the same exhibit
9 The first column of figures headed, "809" is the same
10 as the column, the third column on page 1, and it is
11 carried forward to page 2 for convenience. Then, the
12 additional cost of the 75 million addition purchase is
13 shown in column 2, and the total cost of the 875 million
14 is shown in the third column of figures on page 2 The
15 incremental transport costs from Topock to Milpitas for
16 the 75 million is 4 538 cents. The total transport cost
17 for the 875 million is 7.118 cents, or slightly less than
18 the transport cost for the 700 million shown in the first
19 column of figures on page 1 of 7.351 cents, indicating
20 that this additional gas that it is proposed that we
21 purchase can be delivered to Milpitas at a slightly lower
22 average cost than the cost of the 700 million we are now
23 purchasing similarly delivered at Milpitas.

24 Q Mr. Moulton, is the additional looping described
25 in this amended third supplemental application and also
26 testified to by Mr Pugh necessary to meet the requirements

1 of PG&E's natural gas customers?

2 A It is.

3 Q From what gas fields or areas does El Paso expect,
4 so far as you are informed, to obtain this additional
5 175 million cubic feet of gas daily which El Paso plans
6 to deliver to PG&E?

7 A This additional 175 million is physically to come
8 from fields in the Permian Basin, which is in West Texas
9 and Southeast New Mexico, and from the San Juan Basin,
10 which is in the Northwestern corner of New Mexico and
11 the southwestern corner of Colorado

12 Q Do these fields contain the nearest presently
13 known adequate and dependable gas reserves available as
14 an out-of-state source of supply for PG&E?

15 A Yes.

16 Q What service does PG&E propose to supply to the
17 public upon completion of the additional pipeline facil-
18 ities, which are the subject of this proceeding?

19 A The company proposes to supply its existing system
20 plus extensions to it, which are made in the ordinary
21 course of business

22 Q Will the company's customers, present and prospective,
23 in this gas service area require all of the additional
24 gas proposed to be transported by means of the proposed
25 pipeline facilities?

26 A Yes sir, they will. I think Mr. Ellis' exhibit

1 very clearly shows that to be the case.

2 Q Has El Paso in the past fulfilled its obligations
3 to supply gas to the company at the volumes required by
4 its contracts with PG&E?

5 A It has.

6 Q Do you believe El Paso has or will have the ability
7 to supply PG&E the volumes of gas it has already contracted
8 to deliver, namely approximately 700 million cubic feet
9 daily, and the following additional amounts, and these are
10 set forth in the application 50 million cubic feet of
11 gas per day by November 1, 1956, 75 million cubic feet of
12 gas per day by November 1, 1957; 25 million cubic feet of
13 gas per day by January 1, 1958, and 25 million cubic feet
14 of gas per day by January 1, 1959, making a total of 175
15 million cubic feet per day additional?

16 A The El Paso Company believes that it has that
17 ability and submitted extensive exhibits in support of
18 that belief in hearings before the Federal Power Commission
19 That commission has not yet issued an order in that
20 case where a certificate is requested by El Paso author-
21 izing it to deliver this additional 175 million feet to
22 Pacific Gas and Electric Company.

23 Q Well then, Mr Moulton, if the Federal Power
24 Commission authorizes the delivery of only a portion of
25 this additional gas will Pacific Gas and Electric Company
26 hold all of the looping lines set out in this application

1 and described by Mr. Pugh?

2 A No. It would only build such of those facilities
3 as would be required to handle the volume actually author-
4 ized to be delivered to wit by El Paso.

5 MR. MORRISSEY: And I believe, Mr Examiner, that you
6 will note from the testimony of Mr. Pugh, and the questions
7 that I ask, and his exhibits, that the various incremental
8 amounts that might be not required, shall we say, have
9 been referred to in his exhibit and can be easily identi-
10 fied.

11 EXAMINER EDWARDS: Yes, I understand

12 MR MORRISSEY: What are the basic reasons for Pacific
13 Gas and Electric Company's proposal to increase it s out-
14 of-state natural gas supply to about 885 million cubic
15 feet per day -- 875 million cubic feet per day?

16 A The reasons are, as shown by Mr Ellis's exhibit,
17 there is a substantial growing requirement for gas in the
18 state and in Pacific Gas and Electric territory, the
19 Northern California territory that growth of requirements
20 is accompanied, as shown in Mr. Haavik's exhibit by a
21 material decline in the estimated availability of dry gas
22 and a slight decline in the availability of oil well gas
23 to Northern California

24 That means that on the one hand we have a growing
25 requirement and on the other hand a declining availability
26 of California gas.

1 Those two factors taken together mean that the gap
2 between them must be filled with ever increasing quantities
3 of out-of-state gas if the requirements of our customers
4 are to be adequately met.

5 Q How does the company propose to finance the cost
6 of the additional pipeline facilities?

7 A It proposes to finance the cost of the additional
8 facilities from treasury funds presently on hand, the cash
9 available from internal sources, such as the provisions
10 made for depreciation and amortization, and from unapprop-
11 priated earnings, from short-term bank loans when, as and
12 if required, and from the sale of additional securities
13 as this Commission shall hereafter upon proper authoriza-
14 tion, upon proper application authorize for that purpose

15 Q. What is the average Btu, British thermal unit,
16 content of the gas received from El Paso?

17 A In the ~~last~~ 12 months it has been nearly 1100 Btu,
18 slightly under that

19 Q Assuming that the purchase and delivery of the
20 additional gas, in other words, 875 million cubic feet
21 of 1085 B t.u. gas per day from out-of-state sources
22 would you indicate the number of barrels of oil necessary
23 to produce the equivalent amount of Btu, in your opinion?

24 A Using a somewhat low figure of 6-1/4 million Btu
25 per barrel of oil the equivalent is about 154,000 barrels
26 of oil a day.

1 I might add that that in turn represents about 15
2 percent of the crude oil production in the state at the
3 present time

4 Q And what would be the figure for the additional
5 175 million cubic feet?

6 A The corresponding figure for the 175 million is
7 30,600 barrels per day

8 Q In the event of a National emergency would the
9 existence of these added facilities bring in more natural
10 gas in this area of any beneficial -- would it have a
11 beneficial effect, and if so would you describe it?

12 A I think there can be no doubt but what this additional
13 gas would have a very beneficial effect in the event of a
14 National emergency, and I base that opinion in part on the
15 fact that I served as Assistant District Public Works
16 Officer in this area for over three years during the war
17 and had rather intimate knowledge of the fuel requirements
18 of this area, and the fact that fuel was in very short
19 supply because of the large overseas requirements. With
20 the proposed additional importation of gas from out of
21 state amounting to 30,000 barrels that adds a significant
22 flexibility to the energy supplies in the state, in the
23 northern part of the state, so that in the event of a
24 National emergency the liquid fuels, which can be shipped
25 by tanker overseas, would be released for that purpose
26 while gas which cannot be satisfactorily transported in a

1 similar manner can be used within this area

2 Q Is the project to increase the company's Topock-
3 Milpitas pipeline daily capacity to 885 million cubic feet
4 per day economically feasible?

5 A Yes, I have no doubt about that

6 Q Will you please state briefly your reasons for
7 indicating that it is economically feasible?

8 A. In arriving at my conclusions that the project is
9 definitely economically feasible I have given consideration
10 to a number of factors. One of these is the uses which
11 are made and which prospectively will be made of natural
12 gas in California. Another is the availability and costs
13 of alternate forms of energy Still another is an opinion
14 of the prospective growth of California and the present
15 and prospective energy requirements within the State

16 There is good reason to believe that this is
17 additional -- to believe that this additional 75 million
18 can be marketed without trouble and that the project is
19 completely economically feasible, because as shown in
20 Exhibit 7 the delivered cost of this additional gas is
21 about the same, in fact slightly less than the cost of
22 the 700 million, which we are now receiving from El Paso
23 and which we unquestionably are satisfactorily marketing

24 If it were to be assumed that ~~there~~ will be a future
25 increase in the cost of this gas, I make that assumption
26 merely to test the situation that might exist in that

1 event, I still believe the project would be economically
2 feasible because the value of natural gas service to our
3 firm customers, both intrinsically and in comparison with
4 the cost of alternate fuels, is substantially above our
5 presently effective rates.

6 I would like to point out that a great majority of
7 homes built in California since World War II are one story
8 houses. A great many of them are built on a concrete slab
9 poured directly on the ground without a basement. Where
10 natural gas is available the majority of such homes are
11 designed, built and equipped to use gas for space heating
12 and water heating and generally for cooking. Because of
13 this type of construction the great proportion of our
14 domestic natural gas customers would be confronted with
15 very large expenditures for modification of their homes
16 and for different equipment if they were to change from
17 natural gas to oil for heating and electricity for cooking.
18 The cost of propane and butane is several times that of
19 natural gas and the limited supply of such liquid petro-
20 leum gases would not be adequate for more than a very
21 small fraction of a million two hundred and seventy-five
22 thousand natural gas customers.

23 The greater cost of electricity, particularly for
24 space heating, likewise indicates that domestic and
25 commercial natural gas customers would pay substantially
26 more for natural gas before shifting to another energy

1 source.

2 For these reasons, even if there should be substan-
3 tial future increases in the cost of this out-of-state gas,
4 I believe we would not find a significant reduction in the
5 use of gas because, as I have said, I think it is clearly
6 evident that the value of the service is very much greater
7 than the prices our customers are currently paying for
8 natural gas

9 Now, as to our interruptible customers, including
10 steam electric generating plants, our present rates in
11 most instances are slightly less than the equivalent
12 delivered cost of oil

13 In a few cases restricted to large customers
14 favorably located with respect to oil supplies the costs
15 are more nearly equal. The continued use of gas by such
16 customers is to be expected because of the many advantages
17 natural gas has as a fuel, such as the greater flexibil-
18 ity of use and the lower cost of handling, and of util-
19 izing it.

20 Now, as to the possibility of using coal, the
21 very few deposits which exist in California are of low
22 grade and under present conditions are prohibitively expen-
23 sive to mine

24 If at some future time the importation of coal became
25 necessary it would be cheaper, I am sure, to bring coal
26 from Utah, Colorado and Wyoming, than it would be to

1 produce this California coal

2 The delivery of substantial quantities of coal to
3 California from the states named would require the devel-
4 opment of new mines and the use of rail facilities, part-
5 icularly coal cars which do not now exist, together with
6 the problems of coal storage and handling of ash, ash
7 disposal by the users of coal Any estimates which I have
8 seen of the cost of importing coal indicate that it would
9 cost at least 50 percent more than the present price of
10 oil and more probably double the present price of oil.

11 The forecasts of oil supply in California indicate
12 that crude oil must be brought in from other areas to
13 supplement the California production. California produc-
14 tion, as I think I said earlier, is now about a million
15 barrels a day and most estimates indicate that it will
16 continue at about that level for the next several years

17 The estimates which we have made and the estimates
18 of others which we have checked all indicate that the in-
19 creasing energy requirements of the state will require
20 both additional supplies of oil and additional supplies
21 of natural gas over and above the additional supplies that
22 we are talking about in this application

23 Because of these situations, particularly as to
24 alternate fuels, I am sure there is no present difficulty
25 apparent in marketing this additional gas which we seek
26 to purchase from the El Paso Company at compensatory rates.

1 Q Now, would you please refer to the last of the pro-
2 posed exhibits, which is entitled, "Ordinance No. 760 of
3 the Board of Supervisors of the County of San Bernardino,"
4 and will you tell us whether it is a true copy of that
5 ordinance?

6 A It is a true copy. It is contained in Exhibit
7 SB-10.

8 Q Please state for the record what the cost was to
9 the applicant to acquire that franchise?

10 A The cost was \$513 63

11 MR. MORRISSEY: I would like to call attention, Mr.
12 Examiner, to the fact that the company does not expect to
13 capitalize this franchise at any more than the actual
14 cost in accordance with the usual stipulations

15 EXAMINER EDWARDS That is the law. No need to stip-
16 ulate to it.

17 MR. MORRISSEY: Yes Does the company contemplate
18 that its service under the franchise granted by this ordinance
19 will impinge upon any service, territory of any other gas
20 utility serving in San Bernardino County?

21 A No, it does not The only utility now supplying
22 service in the vicinity of the Topock line in San Bernardino
23 County is the Southwest Gas Company which purchases gas
24 from Pacific Gas and Electric Company and supplies an
25 area in and around Barstow and Victorville.

26 The Southwest Gas Company and the Pacific Gas and

1 Electric Company Company have an agreement including
2 territorial limitations in which each respectively agrees
3 to stay out of the other's territory, with this exception,
4 that PG&E does have the right to serve large industrial
5 interruptible customers above a certain size in the terr-
6 itory of the Southwest Company.

7 Q And you mentioned that was the only one, Mr Moulton
8 Is there not a small company at Needles, or am I mistaken?

9 A Yes, the California-Pacific Utilities Company have
10 a gas distribution system in Needles and a pipeline
11 extending from Needles down to the PG&E Topock compressor
12 plant where we in turn supply gas to California-Pacific
13 for use in Needles.

14 Q Has the Federal Power Commission authorized El Paso
15 to increase its facilities in order to deliver additional
16 volumes of gas, including the delivery of an additional
17 175 million cubic feet of gas per day by El Paso to
18 Pacific Gas and Electric Company?

19 A Not to my knowledge up to the present moment, Mr
20 Morrissey, although the rumors have been flying around hot
21 and heavy that a decision could be expected almost momenta-
22 rily

23 I might add that the applicant's case, or rather
24 the applicants in that case, the El Paso Natural Gas
25 Company and the Pacific Northwest Pipeline, pointed out
26 to the Federal Power Commission that there were a number

1 of contracts which could be terminated by the other parties
2 to them in the event the Federal Power Commission had not
3 granted a certificate by December 1, 1955 So there was
4 great urgency expressed by the parties to that hearing,
5 that the Commission make every possible endeavor to act
6 on the applications prior to December 1st

7 MR. MORRISSEY: Mr Examiner, may an exhibit number be
8 reserved for a late filed exhibit to contain the Federal
9 Power Commission's finding an order affecting this matter
10 when it is issued?

11 EXAMINER EDWARDS Yes, we could reserve exhibit No
12 SB-11, if that meets your pleasure?

13 Very well, Exhibit No SB-11 will be reserved

14 MR. MORRISSEY: I believe that completes Mr. Moulton's
15 direct testimony at this time. If there are any questions
16 for clarification I think this is the proper time to ask
17 them of Mr. Moulton.

18 MR. BECK: Yes, I have a question

19 QUESTIONS FOR CLARIFICATION

20 MR. BECK: Mr. Ellis spoke of this underground storage
21 as the Pleasant Creek underground storage project Where
22 is it located?

23 A That is the contemplated project in the Pleasant
24 Creek field which is in the vicinity of Winters

25 Q I think you are also the policy man on this Do
26 you intend to also look for other sources of underground

1 sources besides what you have in mind at the present time?

2 A Yes We have been studying, both from a physical
3 standpoint, as to whether other gas fields in Northern
4 California could be adapted to underground storage, and
5 the economics of it, as to whether or not such fields are
6 physically suitable for storage and fit into our operations
7 so as to result in a lesser over-all cost of operation
8 than if we postpone the development of storage

9 Q This franchise that you obtained from San Bernardino
10 County, this franchise does not apply wholly to this
11 pipeline, does it? It applies to all distributing systems
12 built in the County of San Bernardino?

13 A That is right. It is a Countywide franchise

14 Q Well, is it your impression that this \$513, I think
15 you said, was the cost of the franchise which would be
16 the only amount to be charged against this pipeline,
17 against the transmission lines?

18 A The cost of \$513.63 would be charged in our accounts
19 as a cost of the franchise

20 Q And it would be applicable to the pipeline as
21 distinguished from any sales of gas in the future?

22 MR. MORRISSEY Well, Mr Beck, for what purpose do
23 you mean it would be charged to the pipeline? I mean,
24 I don't quite understand the purpose of your question

25 MR. BECK: The way this franchise reads: "It shall
26 be 2 percent of their Gross annual receipts arising from

1 the use, operation or possession of the franchise "

2 Now, if you make sales in San Bernardino County,
3 say, well then those sales would be subject to this franchise.
4 He also said he paid \$513. I was wondering if he charged
5 this \$513 as a capital cost as part of this pipeline
6 project?

7 THE WITNESS: No It goes to an entirely different
8 account. It is not identified in any way as associated
9 with the Topock line

10 MR. BECK: Why was this franchise put in at this
11 particular time?

12 MR. MORRISSEY: It was put in because since the last
13 hearing on this particular series of supplemental appli-
14 cations to Application No 29548 the company received
15 this general county franchise and we didn't have it
16 before We had a limited franchise for only the pipeline.

17 Since then we have received this ordinance and
18 it seemed appropriate we should call attention to the
19 fact that we are operating, making additional facilities
20 under this franchise granted by this ordinance.

21 MR BECK: I see You are also asking the Commission
22 at this time to issue a certificate of public convenience
23 and necessity to exercise this franchise?

24 MR. MORRISSEY: That is correct.

25 MR BECK: I think that explains that very fully. I
26 think that is all I have at this time

1 EXAMINER EDWARDS: Mr Rives.

2 MR RIVES: I have none for clarification

3 EXAMINER EDWARDS: Mr. Evers.

4 MR. EVERS I have none for clarification

5 EXAMINER EDWARDS: Thank you. You may stand aside

6 We will have a brief recess

7 (Recess taken)

8 EXAMINER EDWARDS: The Commission will be in order

9 MR. MORRISSEY: Before closing the company's case, I
10 would like to recall Mr. Beckman and ask him one or two
11 questions, and then we will be ready for cross-examination,
12 if that is agreeable to the Examiner.

13 EXAMINER EDWARDS: Very well. Mr Beckman

14 P. E. BECKMAN

15 recalled DIRECT EXAMINATION resumed

16 MR. MORRISSEY: Mr. Beckman, does the company have a
17 desire to have an early decision in this matter which is
18 before the Commission?

19 A Yes.

20 Q And would you explain why the company wishes the
21 Commission to decide this matter at an early date?

22 A Well, recognizing that the PG&E was without author-
23 ity to construct the project until receipt of necessary
24 approval by the FPC and CPUC our understanding with
25 Consolidated Steel stipulated that production capacity --

26 Q Jst one moment there, Mr. Beckman

1 What is the significance of your understanding with
2 Consolidated Western Steel?

3 A In getting pipe ^

4 Q They are the producers, are they not?

5 A That is right.

6 Q Of the pipe And the only producers of this size
7 pipe, isn't that correct?

8 A In this instance, yes, that is right.

9 Q Would you continue, then?

10 A Necessary approval by FPC and CPUC our understanding
11 with Consolidated stipulated that production capacity in
12 the mill for our requirements would be held until November
13 1, 1955 without obligation on our part to place a firm
14 order. At that time it was expected that approvals of the
15 project would be forthcoming by November 1st. Since July,
16 because of other firm obligations for pipe production
17 assumed by Consolidated, promised delivery of our pipe has
18 been delayed in successive stages until it is now scheduled
19 as follows:

20 Delivery of 46 3 miles to commence July 15, 1956
21 and to be completed by August 22, 1956; delivery of
22 38-1/2 miles to commence September 7th and to be completed
23 September 30th These revised deliveries have been
24 predicated on the assumption that we will be in a position
25 to firm our order by December 1, 1955. The revised
26 schedule will make it possible to construct sufficient

1 looping to permit receiving 50 million cubic feet a day
2 from El Paso by November 5, 1956 To do so, however,
3 will require a tie to our main 100 at a point near
4 Gilroy and the employment of two, rather than a single
5 construction spread on the project, both of which steps
6 will of course involve additional construction expense
7 If deliveries are delayed beyond the above dates it will
8 be impossible to complete a sufficient part of the looping
9 to meet our commitment to El Paso.

10 Because of the heavy demand on the Provo Mill --

11 Q Whose mill is that?

12 A Utah. That is Kaiser

13 Q. Whose mill? Isn't that the mill of the Consolidated
14 Western Steel?

15 A Yes. Excuse me

16 (Continuing) -- Provo Mill coupled with a shortage
17 of steel ingots capacity Consolidated has recently approach-
18 ed the management in an effort to get us to agree to defer
19 deliveries beyond the most recent schedule established
20 We have refused to do this for reasons which are obvious.
21 In view of the fact that Consolidated has expected it will
22 receive a firm order by December 1, 1955 it is apparent
23 that our position in endeavoring to induce Consolidated
24 to maintain the schedule is likely to be weakened if the
25 FPC and CPUC certificates are not received by December 1st
26 MR. MORRISSEY Thank you, Mr Beckman.

1 That completes Mr. Beckman's direct testimony, and
2 it also completes the company's presentation of its case
3 in support of its third amended, or rather Amended Third
4 Supplemental Application No. 29548

5 EXAMINER EDWARDS Very well Are we ready for cross-
6 examination now?

7 MR. BECK Yes

8 EXAMINER EDWARDS Mr. Beck

9 CROSS-EXAMINATION

10 MR. BECK Mr. Beckman, on the completion of your 885
11 million cubic feet a day pipeline, as I understand it,
12 you will have two sections which will be unparalleled,
13 is that correct?

14 A Yes.

15 Q I think one is about 29 or 30 miles long north of
16 Kettleman around Fresno and the other one is down near
17 Victorville and --

18 A Could you tell me which sketch you are referring
19 to there?

20 Q I am referring to Mr. Pugh's, but it shows in your
21 exhibit also, that there are two sections

22 A. Yes. At the end of the 885 project you say?

23 Q Yes. And the second section I was speaking of
24 here, there is a difference of about 40 miles which will
25 still be unparalleled?

26 A Yes.

1 Q Do you think the company is taking any undue risk
2 by not paralleling that line and trying to deliver 885
3 million cubic feet a day to Northern California?

4 A There is always a risk to some degree, but the
5 portion which is, if you refer to the single section north
6 and west of Hinkley, that portion is in very good country
7 and the equipment can be moved in there quickly, and as
8 repairs -- and repairs can be made as easily as anyplace
9 else in the line. It is good country to make repairs in

10 Q It is worthwhile to take a calculated risk to save
11 that amount of investment?

12 A. There is a risk at any time. We have been operating
13 under a risk now for several years

14 Q In other words, you are willing to take the risk?

15 A Yes.

16 MR. BECK That is all.

17 MR. RIVES: I have no questions of Mr. Beckman

18 EXAMINER EDWARDS: Mr. Evers

19 MR. EYERS: Yes, I have a few here

20 Can you state what the completion dates are for the
21 various portions of these two projects, Mr. Beckman?

22 A Yes. You mean the completion of the --

23 Q The dates that you expect to put this project or
24 two projects in service?

25 A Well, of course the completion date for receiving
26 the first 50 million, as I stated, would be November 5th

1 The completion date for the others correspond to our
2 commitment to El Paso We haven't gone beyond the first
3 stage of the 50 million in construction detail and install-
4 ation time. The rest of that will be taken later Do
5 you want me to recite the dates?

6 Q Yes, I think it would be good to have them in the
7 record

8 A 50 million, as I stated before, will be carried
9 in the line by November 1956; then 50 million of the
10 100 million incremental project plus 25 million of the
11 75 million incremental project will together be carried
12 November 1, 1957; 25 million of the 75 million project
13 will be carried by January 1, 1958, and the remaining
14 25 million of the 75 million project by January 1, 1959

15 Of course, in the construction the dates given
16 for the two first 25 incremental projects will not be
17 as exact as that. The jobs will run into one another

18 Q But this will not be built as two separate projects
19 but will be built in increments, according to these two
20 delivery schedules you have just given?

21 A Yes I have something else which I can give you
22 by years

23 Q I think this answers the question

24 A I mean I could give you the sections that are to be
25 built and what year they are to be built.

26 Q In examining this my impression was you had two

1 completely separate projects which would be built as units
2 and that apparently is not the case, as you have indicated?

3 A No, that is right

4 Q Page 5, Exhibit SB-2, under the project at the
5 compressor station you mentioned the installation of new
6 cooling towers and scrubbers Could you explain the reason
7 for new cooling towers when there are to be no new compressors
8 installed in that portion of the project?

9 A This is for the 100 million project now?

10 Q Yes.

11 A There will be 16-inch orifice meter tubes installed
12 at each of the stations to handle the larger volume of gas
13 going through That is the additional 100 million I am
14 taking the two pieces together.

15 Now, I am saying the 100 million project whether
16 50 comes in one year or 50 the other.

17 Q Yes.

18 A There will be a dust scrubber added to each of the
19 stations. Of course, that means the pertinent piping has
20 to be added too There will be cooling towers, sections,
21 two cells added at Kettleman Hills That is now for the
22 gas

23 Q Well, I was wondering the reasons for those cooling
24 towers when you are not installing any additional
25 compressor capacity at this time

26 A Well, it so happened that at this particular station

1 we were a little bit shy You can't always keep your
2 construction entirely in line. You can't measure off
3 just the portion of what you want. You have to do it in
4 sections. We found in our operations we were a little
5 bit short on cooling capacity and for that reason this
6 was the time -- for that reason we thought that this
7 would be the time to make the change with the first 800
8 million.

9 There will be station gas piping amounting to
10 about 1,000 feet at Topock and 600 feet at Kettleman.
11 That is, of course, the very thick thirteen-sixteenth
12 steel Then, there is wiring and conduit at each of the
13 stations for the other facilities we have added here, and
14 a load center for that, electric load center for the
15 tower which I just indicated was to be added That
16 constitutes the miscellaneous material that has to be
17 added, exclusive of compressors.

18 Q Do you plan to install a part of your original
19 construction on these new portions of the pipeline
20 cathodic protection?

21 A Yes, we are doing it now It is going to be quite
22 reasonable as we have now analyzed it over the past year
23 to protect line 300 from one end to the other The idea
24 is that we are designed so close as to the steel thickness
25 that there is nothing left for corrosion, so the thing to
26 do is to avert it before it ever begins, and our

1 investigation during this past year has indicated that we
2 can do that at a very reasonable cost. If a line is well
3 insulated by reason of its wrapping being good, one
4 cathodic protection station can be effective 40 to 50 miles.

5 Q Are the costs of that cathodic protection included
6 in these costs that you have shown, or are they separate?

7 A They are separate. But they wouldn't affect the
8 total here very much.

9 Q You ultimately or are planning now to have the entire
10 main 300 protected?

11 A Yes, and the compressor station as well. That is the
12 piping within the compressor stations.

13 Q Will the pipeline and compressor plants be installed
14 by company employees or by contract?

15 A I should say that the chances are that an outside
16 contractor would be used rather than our general construction
17 department to do the installation, and the engineering also
18 will be done by an outside contractor. We are not set
19 up to do that detail in our company.

20 Q Well, will you call for bids on the contract or will
21 you negotiate it?

22 A We will call for bids on it.

23 Q Would you be willing to supply the Commission with
24 a copy of the bids that are received and advise us as to
25 the reasons for not selecting the lowest bidder, if that
26 should be the case?

1 A You raised a question I am not certain I care to
2 venture an answer

3 MR. MORRISSEY: What would be the purpose of that,
4 Mr Eyers?

5 MR. EYERS To let the Commission be advised as to how
6 this is actually being done, and in the event that the
7 lowest bidder is not selected the reasons therefor

8 MR. MORRISSEY: Well, the company is of course willing
9 to supply any information that relates to our operations
10 and which the commission has an interest in directly.

11 I think that it would be unfortunate if the Commission
12 staff should wish the Commission itself to go over in
13 detail the various contracts or to, as it were, second
14 guess the management as to what is the most efficient manner
15 of conducting its business

16 The Commission always has the power of investigation,
17 of course, in any matter regarding our company But I think
18 it might lead to a certain amount of uncertainty on the
19 part of contractors if they felt that the matter should be
20 subject to delay by a possible review of this Commission

21 I should like to ask you whether you believe it is
22 an essential part of this proceeding that the Commission
23 should direct us to do what you are now requesting us to do?

24 MR. EYERS: I have not suggested that it be subject to
25 review. I merely suggested that you file the bids that
26 are received.

1 MR. MORRISSEY: In that connection I would like to point
2 out that our dealings with contractors, of course, are on
3 a confidential basis and the contractors are concerned
4 about the revealing of their bids even after the selected
5 bidder has been selected.

6 In other words, the bidders who are the unsuccessful
7 bidders don't wish in most instances their bids to be
8 revealed, and we don't, as I understand it, reveal them

9 For that reason, it is a matter of, you might say,
10 business operations not to wish the bids to be supplied
11 in a place, a file for instance with the Commission or made
12 generally public. I am sure the company would have no
13 objection to any member of the staff inspecting them, if
14 that would be satisfactory. Certainly we don't wish to
15 preclude the staff of this Commission from doing its duty
16 in looking over our affairs so far as, of course, they
17 have the jurisdiction to do so, and I think they would in
18 this case. But I think that it is unnecessary that it
19 be filed with the Commission, I mean the bids, in detail.

20 I think there is no question but what the staff
21 wishes to examine the bids afterwards we will make them
22 available to be inspected

23 MR. EYERS: I think that would suffice at this point

24 EXAMINER EDWARDS: Very well.

25 MR. EYERS: The company will agree to keep them in such
26 form that they will be readily available for the staff's

1 inspection?

2 MR MORRISSEY Oh, yes.

3 EXAMINER EDWARDS. Anything further now?

4 MR EYERS: Yes, I have two or three more questions

5 Do the design, installation, testing and inspection
6 plans for this pipeline installation conform to the minimum
7 requirements of the American Standard Codes for pressure
8 piping?

9 A I can answer that categorically yes.

10 Q I have several more questions relating to details
11 of this particular Code, Mr Beckman

12 A Yes.

13 MR. MORRISSEY. I might interject myself at this point
14 again

15 Mr Examiner, the staff, through Mr Eyers, has
16 very considerably informed us in advance that they wish
17 to ask certain questions with reference to the American
18 Standard Code for pressure piping and details with respect
19 to, you might say, our application of it insofar as the
20 Code gives us an alternative or perhaps optional means
21 of doing certain work on pressure pipe

22 For the record I might indicate that, and Mr Eyers
23 you might check me if I am wrong, when we talk about this
24 Standard we are referring to Section 8 of American
25 Standard Code for Pressure Piping (A.S.A.B. 31 1-1955),
26 published by the American Society of Mechanical Engineers,

1 29 West 39th Street, New York 18, New York, and that
2 Section is entitled, "Gas transmission and distribution
3 piping systems, (A.S.A B. 31 1.8-1955)."

4 Now, I told Mr. Evers that we were very agreeable
5 to giving him the information which he requested, but I
6 asked him at the time he made the request as to what he
7 expected the relevancy to be of his questions with
8 respect to what the decision would be in this proceeding,
9 and my understanding of his answer was that while it did
10 not directly concern what the Commission would decide in
11 this case it was of interest to the staff and the
12 Commission, and I have no doubts that it is of interest,
13 Mr Examiner, but I merely point out that it doesn't appear
14 to us that it is an appropriate time for the Commission
15 to ask questions of a detailed nature, however we are
16 prepared to answer questions, and I have asked Mr. Smith
17 to come to the hearing today, to answer questions on that
18 subject informally, if Mr Evers could do that right now
19 or after this hearing, or if you rule to do it at this
20 hearing In other words, we are perfectly willing to
21 give the information but it is a lot of detailed infor-
22 mation, as I understand it, and it does seem to me it is
23 going to unnecessarily clutter the record and be of no
24 help in a decision

25 EXAMINER EDWARDS: In the past I don't think we have
26 had this pressure Code As I understand, it is comparatively

1 new, isn't it?

2 MR. EYERS: That is correct It is the first time it
3 has been available to us.

4 EXAMINER EDWARDS We haven't had this to guide us
5 What was the reason why the Code was drawn up at this time?
6 Were there so many pipelines going throughout the United
7 States that it was necessary?

8 MR EYERS: It has been something that has been under
9 consideration for some time, as I understand it, Mr.
10 Examiner There have been committees working on it under
11 the auspices of the American Society of Mechanical
12 Engineers, and they have finally consolidated it into
13 a code If I am not mistaken, I believe the company's
14 witness on this, Mr. Smith, attended a portion of the
15 meetings during which this Code was formulated and prob-
16 ably can give us a great deal of the background and
17 detail that we would like to have.

18 EXAMINER EDWARDS: Well, I would like to go off the
19 record for a moment to clear this up.

20 (Discussion off the record)

21 EXAMINER EDWARDS: On the record, Mr Reporter.

22 Now, did you have any other questions at this time
23 of Mr. Beckman?

24 MR. EYERS No, I have no further questions of Mr.
25 Beckman

26 EXAMINER EDWARDS: Any other questions of Mr. Beckman?

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(No response)

EXAMINER EDWARDS None appearing, you may stand aside,
Mr Beckman

I guess our next witness is Mr. Pugh

JOHN L. PUGH

recalled CROSS-EXAMINATION

EXAMINER EDWARDS: Mr Beck

MR. BECK: No questions of Mr. Pugh

EXAMINER EDWARDS: Mr. Rives.

MR. RIVES Yes, I had a question of Mr. Pugh.

Would you refer to page 1 of your Exhibit SB-3?

MR MORRISSEY This is the first part of that?

MR. RIVES Yes. This is the first page 1. However,
the question could also go to the second page 1 as well.

Mr. Pugh, you were speaking in this portion of the
exhibit about the design conditions, among other things,
and in the center of the page you state that "Assuming
90 degrees Fahrenheit gas temperature and July load
requirements in the Topock-Hinkley section of the pipeline
and a 60 degrees Fahrenheit gas temperature and average
January 1958 load requirements in the Hinkley-Milpitas
section of the pipeline," and on the second page 1 of
the exhibit which deals with the 885.1 million feet per
day project you have a statement which is identical to
the one I just read, except it refers to an average
January 1960 load requirement instead of January 1958

1 That is correct, isn't it?

2 A That is correct, yes

3 Q Now, I just wanted to clarify what you were speaking
4 of there. As I understand it, one of the things you were
5 concerned with in the design of this pipeline and the
6 additions to its capacity, which you are proposing, is the
7 question of sufficient horsepower in the compressor
8 stations to move the gas that you propose to move through
9 it, through the line?

10 A Yes.

11 Q And the temperature of the gas has an effect upon
12 the horsepower required to move a given volume, is that
13 correct?

14 A Yes, that is correct.

15 Q And the horsepower required to move a given volume
16 increases as the temperature of the gas increases?

17 A That is correct.

18 Q And in the Topock-Hinkley section of the pipeline
19 you have quite hot temperatures in the summertime, that
20 being a desert section?

21 A Yes Our experience in observing temperatures both
22 at the Topock station and at the Hinkley station is that
23 the temperatures are in the high 80's for several months
24 at a time, somewhat higher at Topock than at Hinkley, but
25 in each instance the temperatures are, the gas temperatures,
26 that is, are sustained in the high 80's

1 Q So the significant temperature in that portion of
2 the line is the summertime temperature so far as the
3 problem of compressor power requirements is concerned?

4 A Yes, that is right

5 Q And related to that, of course, is the amount of
6 gas that you expect to move through the line during the
7 hot months. And as I understand it, that would be deter-
8 mined by what is necessary to meet the 91 percent load
9 factor requirements of your contract with El Paso Natural
10 Gas Company?

11 A That is right.

12 Q Then, when you come to the northern portion of the
13 line the temperatures are not so critical a factor in
14 determining the compressor requirements. There you use
15 the 60 degree temperature?

16 A Yes, we did

17 MR. MORRISSEY Just a moment Did you answer the
18 first part of Mr Rives' question?

19 MR. RIVES Not so critical? I don't know whether he
20 did or not

21 THE WITNESS. No, the temperatures aren't as high from
22 our experience as they were at the two stations, and they
23 are not as critical at either of the other two stations
24 for the reason that in addition to having to deliver the
25 gas straight through the pipelines in the Topock-Hinkley
26 and in the Hinkley-Kettleman section of the line in the

1 section north of Kettleman, that is in the Kettleman-
2 Milpitas section of the line, we also have built into
3 the project as I mentioned in my direct testimony a pro-
4 vision for storage, and I might say the storage is more
5 essential to our wintertime operations than to our summer-
6 time operations, and as a result discounting the value of
7 the storage ^{space} place somewhat in summer gives us a tolerance
8 to provide the necessary horsepower to overcome temper-
9 atures that would be greater than the 60 degree temper-
10 ature which would be our anticipated wintertime experience
11 for temperatures at Kettleman

12 As a matter of fact, in the summer period the
13 temperatures in the Kettleman station are in the low 70's

14 Q But what you were directing yourself to in making
15 this assumption here was essentially the problem of
16 determining the efficiency of the compressor station out-
17 put or capacity?

18 A That is correct. I might say in summary that to
19 handle gas at a 90 degree suction temperature as opposed
20 to handling gas at a 60 degree suction temperature requires
21 somewheres between five and six percent more horsepower.

22 Q Have you given any thought to further changes in
23 the line which might have to be made if you had a further
24 increase in the gas to be moved over it?

25 In other words, at sometime in the future you
26 obtained more gas from the El Paso Natural Gas Company, as

1 to whether your next step would be to increase compressor
2 capacity or complete the looping of the line, or be given
3 any consideration -- or have you given any consideration
4 to that?

5 A Well, it would generally amount to a combination
6 of both through the several stages of incremental increases
7 in delivery that have occurred since the line was first
8 installed, the improvements required in each instance
9 have been a combination of loop main and compressor horse-
10 power; and as we go forward to pick up more gas than the
11 885 million, though I have made no specific calculations
12 for a given volume, I am confident that we would continue
13 to endeavor to close the open sections in the second line
14 as well as put in the necessary horsepower at the several
15 stations to accomodate the volume of gas that we were
16 desiring to transport across the pipeline.

17 Q You would have to make some additional installations
18 of pipeline or compressors or both in order to be able to
19 handle any additional volume of gas?

20 A Yes, that is true, because this pipeline is designed
21 on the basis of the friction factor that we are presently
22 experiencing in operating it at volumes of 700 million per
23 day, and the amount of tolerance to handle volumes above
24 the planned volumes that are shown in these two sets of
25 sheets in this exhibit are very very small. So it would
26 be necessary as we go forward for substantial increases in

1 volume, I might say any increase in volume to continue to
2 reinforce the pipeline with additional loop main and
3 added horsepower at the several stations.

4 In some instances, it could work out that we might
5 favor the -- the economics might work out that it would
6 require only horsepower at certain of the stations with
7 additional loop main in between endeavoring to close the
8 pipeline to achieve the dual line all the way through as
9 opposed to putting in partial paralleling and horsepower
10 at each of the compressor stations

11 MR. RIVES: Mr Morrissey -- if I may address a question
12 to counsel, Mr Examiner?

13 EXAMINER EDWARDS Very well

14 MR. RIVES: I think you have spoken at time of 875
15 million cubic feet a day, and reference has been made to
16 885 Is that merely because you are using different
17 pressure bases?

18 MR. MORRISSEY That is right There is some confusion
19 with reference to that, and I think Mr. Moulton explained
20 it, and it is also explained in the application, in the
21 footnote on page 1

22 MR. RIVES: I haven't seen the application But that
23 is all I have Thank you,, Mr. Pugh

24 EXAMINER EDWARDS Mr. Eyers

25 MR. EYERS: Yes. Do you have the exhibit in front of
26 you that you used in the last supplemental, Mr. Pugh,

1 SA-6, I believe it was? SA-3. That was your exhibit in
2 the last supplemental application?

3 A. I think I have a copy Yes, I have a copy

4 Q On page two-three of that exhibit you have a flow
5 diagram similar to the one you have shown on page 3 of this
6 exhibit On the former exhibit you show loop main, miles
7 of loop main installed existing and proposed, and I notice
8 the sum of those differs from the amount of miles of loop
9 main installed existing and proposed or installed and
10 existing on your current application Can you state the
11 reason for those differences?

12 MR. MORRISSEY: Would you help us, Mr Evers, by point-
13 ing out the exact figures?

14 MR. EYERS: Yes. Looking at the Hinkley-Kettleman
15 section you propose there to install 137 05 miles of loop
16 main on the second supplemental application

17 You now show 127 30 miles of loop main installed,
18 a difference of some 10 miles

19 A I might say this, as the application covering the
20 708 million per day project was proposed the amount of loop
21 main was calculated on the basis of a pipeline friction
22 factor of "F" equals 0 00255' compared to a friction factor
23 for which the present application was calculated of
24 "F" equals 0023, which factor is the factor that is
25 presently being experienced on the pipeline and was the
26 same level of friction factor that was being experienced

1 prior to the time the construction for the 708 million
2 project was installed

3 We took our calculations based on "F" 00255 and
4 reviewed what saving in loop main could be made if the
5 pipeline ^{was} ~~wasn't~~ designed instead for a factor of "F"
6 0023, and it amounted to an over-all saving of some
7 20 miles, as I recall, and that saving was spread across
8 the pipeline, that is, a portion of the saving was between
9 Milpitas and Kettleman, a portion between Kettleman and
10 Hinkley, and a portion between Hinkley and Topock

11 Specifically, referring to the exhibit you first
12 asked me to look at, that is, SA-3, the loop main that
13 was left out in the Hinkley-Kettleman section of the
14 pipeline was an 8-mile section on the right side of that
15 diagram which was shown in red. The other differences
16 that result from the figures that were proposed on sheet
17 1 of Exhibit SA-3, come about from the difference in the
18 pipeline as it was actually installed after the right of
19 way was firmly nailed down compared to the figures that
20 were shown in the exhibit which had a slight tolerance
21 for right of way divergence in them, not knowing at the
22 time -- I will put it this way -- the right of way at
23 the time the exhibits were prepared had not yet been
24 determined exactly enough to say that the mileages would
25 be what they actually turned out to be.

26 Q I presume you are making tests of the actual

1 experience for friction factor in the line after it has
2 been constructed, is that correct?

3 A We have generally been making periodic tests of
4 the friction factor of this pipeline.

5 Q What factor have you been actually finding as a
6 result of those experimental tests?

7 A As I say, our experience has shown that the
8 actual friction factor for the 34-inch pipeline is 0.0023

9 Q You are using the actual experimental value as
10 a design value?

11 A That is what we are using in this particular appli-
12 cation. It seems to have sustained itself, and over a
13 sufficient period of years that we feel it is a reasonable
14 basis to proceed on.

15 Q In designing the compressor stations have you
16 considered the use of centrifugal compressors?

17 A Prior to the time we moved forward with our seven-
18 hundred and eight million project we made some analysis
19 of the use of centrifugal compressors in pipelines and
20 it appeared to us that they didn't result in any partic-
21 ular saving over the long run. The main reasons were two.
22 The spacing between stations was very small for deliveries
23 of 800 million a day via a single pipeline. As I recall,
24 the spacing was somewhere around 25 to 30 miles handling
25 volumes of around 800 million via the single pipeline,
26 and costwise the economics did not seem to justify their

1 use, and further we realize that the large increases that
2 were coming about via this pipeline, that there was much
3 to be said from having the advantages of a dual pipeline
4 system bringing this gas into the Northern California service
5 area

6 Q Now, your supplier El Paso uses centrifugal
7 compressors to a great extent, do they not?

8 A. That is correct, but I might point out in the case
9 of El Paso's adaptation of centrifugal compressors to their
10 pipelines they had at the time the centrifugal compressors
11 were installed with ^a dual pipeline with reciprocating stations
12 set at about, or separated at about 100 mile spacings, and
13 as I viewed their problem at that time, it was either
14 necessary to start a third pipeline or to augment their
15 deliveries by intermediate compressor stations, and they
16 chose in that instance to use the centrifugals to effect
17 intermediate stations between the reciprocating stations
18 that were on their then existing dual pipeline I don't
19 think the adaptation of centrifugals in the instance of
20 El Paso's project applies in the present stage of con-
21 struction for the Topock-Milpitas pipeline

22 Q It would be possible to put two stages of
23 compression in at your present compressor stations,
24 would it not, and not space them so close together?

25 A Well, in ever so many instances on the present
26 pipeline we are working very close to the maximum working

1 pressure of this pipeline and though we could compress gas
2 at our existing stations through two stage operation I don't
3 see that it would particularly benefit us, in that we are
4 limited by the working pressure ^{limit} being on the pipeline

5 Q Are you familiar with El Paso's operating
6 results and operating costs on their centrifugals as
7 compared to the reciprocating?

8 A No, I am not sufficiently familiar with them to
9 quote any facts and figures I do know this, that one of
10 the most telling selling points for the centrifugal
11 stations as they were first advanced and introduced to
12 the industry was the fact that installationwise they
13 should be very attractive in that their costs were supposed
14 to be much under the comparable costs to install
15 reciprocating stations on a horsepower basis, and I am
16 given to understand that subsequent to the actual install-
17 ation of these compressors that that fact has not been
18 borne out

19 In other words, the installation costs on a
20 per horsepower basis is very comparable to the industry
21 experience in installing reciprocating stations

22 Q How about the operating and maintenance costs?

23 A Well, they have a greater fuel requirement on a
24 per horsepower basis, and in a particular station generally
25 there is a manpower saving, but offsetting that manpower
26 saving is the higher fuel requirement, plus the fact that

1 as I say to operate with the centrifugal stations you have
2 a closer station spacing which tends to call for more
3 stations, so that tends to somewhat compensate for the
4 lesser manpower per station, in that you require a closer
5 spacing with more stations to handle the gas at the lower
6 compression ratio

7 Q You have no seen the actual results from El Paso,
8 though?

9 A No, I have not had sufficient contacts with
10 El Paso to know specifically of their actual costs

11 MR. EYERS: That is all I have of Mr Pugh

12 EXAMINER EDWARDS: Any other questions?

13 (No response)

14 EXAMINER EDWARDS. I might ask you, Mr Pugh, on page
15 3 I notice your heaviest wall pipe is down at the lowest
16 pressure end near Milpitas Can you explain why you have
17 the half-inch pipe in there, the half-inch wall pipe?

18 A In that section immediately south of Milpitas
19 the pipeline extends through the eastern extremities of
20 San Jose proper and as the pipeline was initially
21 designed it was realized the growth contiguous to San Jose
22 would be such that in the not too distant future that
23 most of that area could be very definitely of a rather
24 congested suburban type of development, and the wall thick-
25 ness there was intentionally upgraded to permit a more
26 conservative factor of safety to be established forthat

1 section of the pipeline due to the urban characteristic
2 of the country that it would be traversing.

3 EXAMINER EDWARDS: Any other questions now of Mr. Pugh?
4 (No response)

5 EXAMINER EDWARDS: Any redirect?

6 MR. MORRISSEY No, I have no questions.

7 EXAMINER EDWARDS: Apparently not. You may stand
8 aside. Thank you.

9 Mr. Haavik.

10 MR. MORRISSEY. Do you mean to excuse Mr. Pugh?

11 EXAMINER EDWARDS: I understand he is through.

12 MR. MORRISSEY Thank you

13 S. A. HAAVIK

14 recalled CROSS-EXAMINATION

15 MR. BECK. No questions of Mr Haavik.

16 MR. RIVES: I have about one

17 Referring to page 1 of your Exhibit SB-4 you show
18 estimated availability of gas including dry gas for a
19 6-year period from 1955-'56 and 1960-'61, during that time
20 the total dry gas supply declined from 698 million cubic
21 feet maximum daily availability, I think it is, to 535.5.
22 Is the present expectation that this rate of decline will
23 continue on beyond 1960-'61 at somewhere near the same
24 rate, or have you looked that far ahead?

25 A Yes sir, Mr. Rives The figures you quoted were
26 from line 47 at page 1. Incidentally, that is a 5-year

1 period I believe I pointed out in connection with the
2 tabulations in Exhibit SB-5 that the dry gas decline
3 shown on line 1 would decline from 698 3 million a day
4 in the winter of 1955-'56 to 501 9 million a day in 1961-'62
5 which is a 6-year period

6 I think it is reasonable to expect, however, that
7 the indicated rate of decline may be softened by the
8 discovery of new dry gas fields

9 This decline rate has been applied and would
10 extend beyond this into the future for the fields about
11 which we now know

12 Q You say it might be softened by additional
13 supplies That means supplies that might or might not
14 be discovered?

15 A Yes sir

16 Q That you do not know of now?

17 A Yes

18 Q And if there were no new discoveries this rate
19 of decline which seems to be somewhere around 33 million,
20 or thereabouts, each year would be expected to continue
21 into the future?

22 A Yes sir.

23 Q The supply of oil well gas is relatively constant
24 In making that estimate have you taken into account all
25 that you presently know about repressuring programs and
26 plans of the oil companies?

1 A Yes, sir, we have

2 Q Do you expect any improvement in the availability
3 of that type of gas in the foreseeable future?

4 A In the foreseeable future, yes, but I don't think
5 that we could expect any improvement in perhaps less than
6 10 years

7 Q When it commences to improve will it be in a
8 material fashion or -- in other words, a factor that will
9 be felt in the total gas supply picture?

10 A I think the improvement in the rate of oil well
11 gas supply as a result of the curtailment of these injection
12 projects will be rather gradual

13 Q I suppose it is virtually impossible to evaluate
14 them now?

15 A Yes sir In my opinion, the feasibility of those
16 projects is governed largely by economics as they exist
17 from day to day

18 MR. RIVES: Thank you

19 EXAMINER EDWARDS: Mr Eyers

20 MR. EYERS Comparing your Exhibit SA-4 in the last
21 proceeding with this one I notice a slight difference in
22 the amount of standby gas Could you tell me offhand
23 what the change was that occasioned that?

24 MR. MORRISSEY: What figures are you referring to,
25 Mr Eyers?

26 I think it would be helpful if you gave the exact

1 figures

2 MR. EYERS. I will as soon as he gets the exhibit

3 MR. MORRISSEY All right, fine

4 MR. EYERS Page 8 You list in detail the capacities
5 of standby plants However, on the current exhibit you
6 only give a total, and there is a slight difference between
7 the two

8 THE WITNESS Mr Eyers, I believe you are referring
9 to page 8 of Exhibit SA-4 in which the estimated combined
10 total standby plant output capacity was shown as 128,320
11 Mcf?

12 Q Yes

13 A In round figures that would be 128 3 million cubic
14 feet compared with the figure I have used of 127 4

15 If I can take time now to refer to another
16 document I think I can run that down

17 EXAMINER EDWARDS Will that take some time?

18 THE WITNESS I think it will only take a minute

19 MR. MORRISSEY: You feel that this discrepancy or
20 difference is significant, Mr Eyers?

21 MR. EYERS Well, I hadn't known there had been any
22 changes made in the standby plants and for that reason I
23 am interested in the decrease in capacity If it is going
24 to take any time, later on will be sufficient, the answer

25 THE WITNESS: I don't seem to be able to find it
26 readily

1 MR. MORRISSEY: Perhaps, Mr. Examiner, we could defer
2 this question and Mr Haavik will have it later before we
3 close today

4 EXAMINER EDWARDS: Very well Do you have anything
5 else now?

6 MR. EYERS: No, that is all I have

7 EXAMINER EDWARDS: Mr Beck

8 MR. BECK Just one question

9 This underground storage we were speaking of
10 before, what type of gas will you store underground?

11 A Natural gas.

12 Q Well, where is it coming from, from California
13 sources or El Paso?

14 A Physically in this instance, Mr. Beck, it would
15 be gas from California fields

16 MR. BECK: That is all

17 EXAMINER EDWARDS: Apparently that is all the
18 questions, Mr Haavik

19 Any redirect of this witness?

20 (No response)

21 EXAMINER EDWARDS: Apparently not You may stand
22 aside.

23 We will have a brief recess

24 (Recess taken)

25 EXAMINER EDWARDS: The Commission will be in order

26 Do you have any further questions now?

1 MR. MORRISSEY Mr. Haavik, I believe Mr Examiner,
2 has the answer to that question now

3 EXAMINER EDWARDS Will you resume the stand, Mr
4 Haavik

5 S. A. HAAVIK

6 recalled REDIRECT EXAMINATION

7 MR. MORRISSEY: Mr Haavik, do you have the answer
8 to the question?

9 A Yes sir, I do

10 Q Would you give us the answer which reconciles those
11 two figures or explains them? That is, with reference to
12 standby gas?

13 A With reference to standby gas, page 8 of Exhibit
14 SA-4, listed capacities of applicant's standby plants The
15 Eureka plant listed as the Eureka High Btu oil gas plant
16 with a capacity of 1200 Mcf per day has been retired The
17 Stockton High Btu oil gas plant with a capacity of 3,000
18 Mcf per day has also been retired. To the liquid petroleum
19 gas list shown on that page we should add the Santa Cruz
20 plant at one-five-eight-four Mcf per day, and the Willows
21 plant at one-four-four-zero Mcf per day The Eureka and
22 Stockton retirements total 4200 Mcf per day and should be
23 deducted at 90 percent of capacity.

24 These changes I think I will reconcile the estimated
25 combined total standby plant output capacity as shown at
26 page 8 in Exhibit SA-4 with the current estimate of 127 4

1 million a day

2 MR. EYERS: Thank you That is all I have of Mr
3 Haavik

4 EXAMINER EDWARDS Any other questions of Mr Haavik?

5 MR. MORRISSEY: No further questions

6 EXAMINER EDWARDS: None appearing, you may be excused,
7 sir Thank you

8 Mr Ellis

9 J J. W. ELLIS

10 recalled CROSS-EXAMINATION

11 EXAMINER EDWARDS: Questions, Mr Beck?

12 MR. BECK: No questions of Mr Ellis

13 EXAMINER EDWARDS: Mr Rives

14 MR. RIVES: I have no questions

15 EXAMINER EDWARDS: Mr Evers

16 MR. EYERS: Yes sir.

17 Did you use, in preparing this Exhibit, Mr Ellis,
18 the same methods of making the estimate that you used in
19 the preceding application?

20 A Same general methods, yes sir.

21 Q So that the questions that were then asked that
22 went into the detail of the method would still be applicable
23 in general?

24 A. In general, yes There may be some minor
25 differences, Mr Evers

26 I don't recall the detail of the former estimate

1 now

2 Q Yes, but you have not changed in general, you have
3 not changed your method of making the estimate since that
4 time?

5 A That is true I might state that in this setup
6 since the other estimate was prepared we have acquired
7 the Coast Counties and merged it with the PG&E, and
8 because we didn't have any records on a merged basis I
9 made the estimates for the Coast Counties separate and then
10 added in the PG&E estimates to produce the figures shown
11 in this exhibit

12 MR. EYERS: That is all I have

13 EXAMINER EDWARDS: Mr Ellis, in general what is the
14 effect of adding an underground storage on the interruptible
15 sales? Would that affect the interruptible industrial
16 sales?

17 A Yes, because of the use of the underground
18 storage you are able to sell a little more gas to the
19 interruptible customers at times

20 Q Did the summertime -- strike that, Mr Reporter,
21 please

22 In the summertime you would expect some gas from
23 your available supply and place it underground; in the
24 wintertime you would make it available Would that
25 increase or decrease over the year?

26 A Over the year makes a little greater supply

1 available for the interruptibles

2 Q Now, you said something about the fact that this
3 does not include the Trona extension

4 A That is correct

5 Q I just wondered, have you obtained a certificate
6 to supply the Trona area as yet? Has the company obtained
7 a certificate?

8 MR. MORRISSEY: I can answer that question The answer
9 is yes, we have, from this Commission

10 EXAMINER EDWARDS: Do you have any estimate as to how
11 much supply you might -- I mean what the requirements might
12 be on the Trona area?

13 A I do have with respect to interruptible business,
14 but I have made no separate estimates of the firm business
15 that might be attached there I believe there may be
16 seven or eight hundred customers possible, potential there,
17 but I didn't make any separate estimate of it

18 My remarks were particularly as to the interruptible
19 business, some of which is already being served

20 MR. MORRISSEY: Mr. Examiner, you may refer to
21 Decision 51666, which was issued or dated the 12th day of
22 July 1955 and issued in connection with Application No
23 36889, 36890 and 36891, which grants the company a
24 certificate to serve the Trona area and sets forth what the
25 company estimated the requirements of that line to be

26 EXAMINER EDWARDS Then, as you say, you have not in-
cluded and of those requirements in this instance?

1 THE WITNESS: That is correct.

2 Q If you had included those requirements what partic-
3 ularly, I mean in general would have been the effect of
4 them? Would there be less available or more deficiencies?

5 A I was looking through my papers here I had some
6 rough calculations made of the amount, but generally speak-
7 ing, without looking for those figures, we would be able to
8 serve more gas On a peak day, whether or not it would be
9 a greater deficiency, would depend on whether my estimate
10 of customers that I have made is high enough or not. I
11 think it probably would -- there would probably be a little
12 more deficiency

13 Q In other words, the largest load down there is an
14 interruptible load, in the Trona area?

15 A Yes, not just one, but there are a number of
16 interruptible loads

17 EXAMINER EDWARDS Is there anything else now of Mr Ellis?

18 MR. EYERS: Mr Examiner, I will ask this question of
19 your first Because of the changes in the El Paso supply
20 there have been certain changes resulting in changes in
21 the report furnished in connection with Case 5272 The
22 staff has been furnished a reconciliation of those
23 differences. Would you care to have that in this record?

24 The reason I ask at this point, Mr Ellis is the
25 man that would provide that reconciliation

26 EXAMINER EDWARDS Well, let's go off the record a

1 minute.

2 (Off the record discussion)

3 EXAMINER EDWARDS On the record.

4 What is the principal difference 'between' the two
5 reports now, Mr. Ellis?

6 THE WITNESS: Well, the main differentiation is the
7 5272 report contemplated a total out-of-state supply of
8 925 million cubic feet per day, whereas the present
9 application 29548, Third Supplemental, contemplates 875
10 million cubic feet a day from out of state

11 Q Then, the principal difference in the figures
12 would be 50 million cubic feet per day?

13 A Yes sir. The basic estimates are the same

14 EXAMINER EDWARDS: I see Well, I don't think we need
15 to burden the record here with that detail, then

16 Now, is there anything further?

17 MR. EYERS That is all I have of Mr. Ellis

18 EXAMINER EDWARDS I guess if there is nothing else
19 to come before Mr. Ellis, nothing else to come in at this
20 time, Mr Ellis, you may stand aside. Thank you

21 Mr. Moulton

22 J. S. MOULTON

23 recalled CROSS-EXAMINATION

24 EXAMINER EDWARDS Mr. Beck, any questions?

25 MR. BECK There is no amount of money included in your
26 Exhibit SB-7 for the operation of this underground storage,

1 is there, Mr Moulton?

2 A No sir.

3 Q That is a separate operation altogether?

4 A Yes.

5 MR. BECK: That is all.

6 EXAMINER EDWARDS: Mr. Rives

7 MR. RIVES: Mr Moulton, with respect to the underground
8 storage that you have mentioned in your testimony and which
9 is reflected in these exhibits I take it that is to be the
10 subject of a separate application before the Commission,
11 is it not?

12 A That is correct.

13 Q And you indicate in your testimony that the company
14 is continuing to examine and investigate possible additional
15 underground storage basins or reservoirs?

16 A That is correct.

17 Q And that you had nothing specific on any others at
18 the present time, I believe

19 A No sir.

20 Q As I understand it, Mr. Moulton, you do not look
21 upon the addition of underground storage to your system as
22 a substitute for procuring additional supplies of gas,
23 whether from out of state or from other sources?

24 A No. We look on it only as a supplement when
25 necessary because the underground storage so far is more
26 expensive than buying additional gas that can be absorbed

1 in our system by our total requirements.

2 Q And it does not produce any additional total Mcf to
3 be delivered during the year from your system?

4 It merely changes the time at which you must dispose
5 of the gas, isn't that correct?

6 A No, that is not entirely correct, Mr. Rives, because
7 there are times when we are entitled to buy gas, particularly
8 from the El Paso Company, at a higher load factor than we
9 are able to absorb it, and if we, for example, on warm
10 summer weekends where we have to cut back our purchases
11 from El Paso, if we had underground storage facilities into
12 which we could inject that gas we would simply buy more.
13 It wouldn't affect our deliveries to our customers because
14 they would be getting all they wanted. We would put it
15 in storage and then withdrawing it at a later time it would
16 be sold to our customers, so to that extent it would at
17 times in the manner I explained actually increase the total
18 volume of gas available to our customers

19 Q The extent to which that would be true would depend
20 upon the quantitative relationship between underground
21 storage and out-of-state purchases?

22 A That is right

23 MR. RIVES: That is all.

24 EXAMINER EDWARDS Mr. Eyers.

25 MR. EYERS In your Exhibit SB-9, Mr. Moulton, there is
26 a price quoted for the purchases of gas in the letter of

1 intent on page 2 in the end of the second paragraph of
2 that page?

3 A. Yes sir.

4 Q I presume you used that price for estimating
5 purposes in this application?

6 A No, I did not. I used the present rate which is
7 the only rate El Paso is presently authorized to charge
8 us, namely the \$2 per month per Mcf of certificated demand
9 plus 18 cents per Mcf.

10 Another reason I didn't use this price that might
11 exceed that by 2-3/4 cents per Mcf for certain of the
12 additional gas was that in the hearing before the Federal
13 Power Commission the El Paso Company presented through
14 Witness Dunn a cost of service study projected out for the
15 next several years and assigned to the California companies
16 on a cost basis a rate of \$2 per month per Mcf of certif-
17 icated demand plus only 17 3 cents per Mcf. If we assume
18 that might be the rate in the future authorized by the
19 Federal Power Commission the saving as between 17.3 cents
20 and the price, commodity price we are now paying of 18
21 cents would more than offset this slight increase you
22 mention on a very small portion of the total volume of
23 gas we would be buying.

24 Q And of course this price as mentioned here is subject
25 to change by the Federal Power Commission is it not?

26 A That is right.

1 Q You have mentioned in your direct testimony that
2 you will execute a new service agreement with El Paso or
3 expect to execute one, if this Commission and the Federal
4 Power Commission approve your application?

5 A We expect to execute a new service agreement with
6 El Paso. It is not our application to the Federal Power
7 Commission.

8 Q I understand that But if the pending applications
9 are approved Would you file a copy of that with this
10 Commission if you execute one?

11 A Yes.

12 Q With reference to your Exhibit SB-10, which is the
13 Ordinance No 760 you are presently certificated, are you
14 not, to serve a portion of San Bernardino County under
15 that ordinance?

16 A Yes sir. We were given a limited certificate in
17 connection with the Trona extension under this ordinance

18 Q Now, in this application is it your intention
19 merely to replace your operative franchise that you are
20 now using for the pipeline with this certificate?

21 MR. MORRISSEY: Well, it is the intention, Mr Evers,
22 to supplement it with this We don't intend to relinquish
23 our franchise that we already have. But this would
24 complement it.

25 MR. EYERS: This would complement it?

26 MR. MORRISSEY: That is right, and since it is more

1 extensive it would naturally, you might say, to all intents
2 and purposes supersede it

3 MR. EYERS: Under this franchise do you plan to enter
4 into a general gas business in San Bernardino County?

5 MR. MORRISSEY: Well, Mr. Moulton can probably answer
6 that question. That is a question of policy

7 THE WITNESS: It is our present intention to supply
8 such additional business as we can serve in the ordinary
9 course of business under our rules along the Topock line
10 and where large loads are in the prospect by the negotia-
11 tion of special contracts come before this Commission seek-
12 ing approval of those contracts.

13 Q But you would pick up, plan then to pick up resid-
14 ential consumers as such if they come within your definition
15 in the ordinary course of business?

16 A. Yes, we have been requested and I don't recall
17 whether it was an informal request of the staff or a
18 formal request from the Commission, that we inform the
19 Commission or the staff of our plans to supply any new
20 areas along the line before we actually supply service.

21 Q I believe that was the provision of one of the
22 Commission's orders earlier in this proceeding?

23 MR. MORRISSEY: Yes, that is correct, Mr. EYERS.

24 MR. EYERS: And you do not plan by using this -- that
25 if this particular franchise is granted as you request
26 to change that provision or feel that this new certificate

1 would change or amend that older provision under the
2 other certificate?

3 MR. MORRISSEY: Well, since this is a legal matter
4 perhaps I could answer this

5 Mr. Moulton can correct me if he wishes

6 This is a Decision 49101, Mr. Examiner, in the
7 ordering portion of which, and I might add that this
8 decision was rendered prior to the time that we had a
9 general county franchise, but in the ordering portion of
10 this decision 49101, paragraph 6, provision is made that
11 before rendering service to any new customer within the
12 certificated area in San Bernardino County, that being
13 10 miles on either side of the Topock main, shall first
14 submit the name and location of proposed gas load customer,
15 of the proposed gas load customer to this Commission, and
16 then shall not serve any new customer outside of the
17 certificated area in San Bernardino County or from Taps
18 taken off the Topock-Milpitas line in San Bernardino
19 County except upon further certificate of this Commission
20 first obtained It is our hope, Mr Examiner, that to
21 some extent those restrictions would be relaxed as a
22 result of the new conditions down in that area It is
23 growing very rapidly, and in addition our having obtained
24 a general county franchise, and so we would hope we would
25 have the same type of certificate as do other companies
26 in that area or in San Bernardino county having general

1 county franchises In other words, we would be certificated
2 to serve in the areas and where we are serving and to make
3 normal extensions in the ordinary course of business as
4 provided in Section 1001 of the Public Utilities Code.

5 MR. EYERS: I believe that answers my question on that
6 point.

7 EXAMINER EDWARDS: Very well.

8 MR. EYERS Referring now to your Exhibit SB-7,
9 Mr Moulton, on page 1 under the 708 deliveries you show
10 a figure of ninety-nine million eight-fifteen as the
11 cost of plant plus working capital Is that the historical
12 cost or is that the present depreciated cost of those
13 facilities?

14 A. That is the historical cost new of those facilities.

15 Q You explain down further on the page under annual
16 transportation costs you have the item "Other operation
17 and maintenance costs" and you show a figure of \$236,000.
18 Could you explain in a little bit more detail what items
19 that is composed of?

20 A I apologize for the delay, Mr. Eyers. I have a
21 great deal of detail here and I at the moment don't find
22 the sheet in which it is brought together in the same
23 summary that it is on this table.

24 I think I will find it in a moment

25 It is essentially supervision and engineering,
26 Mr Eyers, in addition to the direct operating and

1 maintenance costs associated with the compressor plants
2 or the pipeline

3 MR. EYERS: Now, in your last exhibit on this same
4 thing or the same amount 708 quantity you estimated that
5 this would be one hundred eleven thousand; that was in
6 your Exhibit SA-6 on page 1 on the far right-hand column
7 for the 708 deliveries; and that figure, as you can see,
8 has more than doubled and is the only figure that I don't
9 find a ready explanation for?

10 A Well, yes. Substantially, it is the difference in
11 the experience between 1953 when this earlier estimate
12 was made and our experience at the present time when we
13 find that that line requires and because of its importance
14 to us should have more supervision than our previous
15 estimate

16 I think our previous estimate was or is now very
17 much on the low side. The present figures are based on
18 our present operations.

19 Q And are the result of direct experience at this
20 time?

21 A Yes.

22 MR. EYERS: That is all I have.

23 EXAMINER EDWARDS: Are there any other questions now of
24 Mr. Moulton?

25 (No response)

26 EXAMINER EDWARDS: I was just looking through my notes

1 to see if I had any question marks I don't seem to have
2 any, Mr. Moulton

3 Is there anything further now?

4 (No response)

5 EXAMINER EDWARDS: Apparently you may stand aside,
6 Mr. Moulton. Thank you.

7 Anything further now to come before us before
8 we discuss this matter of the staff's questions?

9 MR. MORRISSEY: Well, no. I would just like to close,
10 and perhaps this is the time

11 EXAMINER EDWARDS: You wish to make a closing statement?

12 MR. MORRISSEY: No extensive closing statement.

13 EXAMINER EDWARDS: Do you have any closing statement,
14 Mr. Beck?

15 MR. BECK: No, we have no objection to the granting
16 of the certificate

17 EXAMINER EDWARDS: Mr. Rives.

18 MR. RIVES: No, we have no closing statement.

19 EXAMINER EDWARDS: Very well. Off the record,
20 Mr. Reporter.

21 (Off the record discussion)

22 EXAMINER EDWARDS: On the record, Mr. Reporter.

23 Now, Mr. Rives, did you have any statement of
24 position here? Are you opposed to this application?

25 MR. RIVES: No sir, we are not opposed to it at all
26 We are in favor of it.

1 EXAMINER EDWARDS: Very well. We now have some
2 questions that I think it would be prudent to place into
3 the record, Mr. Evers, questions Mr Evers will ask of
4 Mr. Smith

5 ROSCOE D. SMITH, a witness called by the Commission
6 staff, after having been first duly sworn, testified as
7 follows:

8 DIRECT EXAMINATION

9 EXAMINER EDWARDS: Please be seated and give your name
10 and address for the record, sir

11 THE WITNESS: Roscoe D. Smith, 33 Yolando Drive, San
12 Anselmo, California

13 MR. MORRISSEY: I would just like to call your attention
14 at this time, Mr Examiner, to the fact that Mr. Smith is
15 testifying at your request concerning this American Standard
16 Code and we are willing to have him testify, but I would
17 like to reiterate what I said before. Wedon't see the
18 relevancy in view of the fact that theCommission has
19 already been advised by Mr Beckman under oath that we
20 plan to conform in the construction of these facilities
21 which are under hearing today to the code in question

22 EXAMINER EDWARDS: Yes, I understand that, and the
23 Commission will give such due weight as it deems proper
24 here, and if you will proceed, Mr Evers, to ask your
25 questions

26 First of all, as to the qualifications of Mr. Smith,
would you kindly tell us your position and your experience

1 briefly?

2 THE WITNESS. I attended Healds Engineering College
3 in San Francisco for about two years, 1927, '8 and '9,
4 leaving to become a field engineer in the pipeline con-
5 struction department of PG&E

6 In 1930 I was transferred into the department of
7 gas construction and operation as an assistant engineer,
8 later becoming an engineer in the department of gas
9 operations, and in 1950 became General Superintendent of
10 transmission and distribution in the department of gas
11 operations

12 During that time I had some direct and general
13 supervision over the selection of materials, construction
14 specifications, standards and equipment for all phases
15 of the gas transmission and distribution system.

16 I have been a member of the Pacific Coast Gas
17 Association for 25 years, and upon the formation of the
18 subcommittee eight of the American Standard Association
19 Committee B-31.1, which was formed in 1952 to rewrite
20 the American Standard Code for pressure piping. I was
21 made a member of that committee and served as a member
22 and subchairman of the committee until the issuance of
23 the Code Upon the issuance of the Code the committee --

24 MR. MORRISSEY: Mr Smith, when you are referring to
25 the Code do you refer to the document which I read into
26 the record sometime ago?

1 A. Yes, I do

2 Q In other words, it has to do with gas pressure pipe,
3 doesn't it?

4 A It is. It is Section 8 of the American Standard
5 Association, Code B-31.1 8 for gas transmission and dis-
6 tribution piping systems.

7 As I stated, I was a member of that committee from
8 its inception It is now a standing committee, and it is
9 the intent for that committee to continue to review the
10 comments which we receive from people respecting the Code
11 and to attempt to continue to improve it and make it a
12 safe Code and one that is generally accepted throughout
13 the country as the industry Code for safety and gas
14 transmission and distribution work.

15 MR. MORRISSEY And how active has that committee been?

16 A Well, since 1952 we have had at least a dozen
17 meeting, I believe

18 Q Have you attended those meetings?

19 A I have attended all of the meetings And on the
20 committee there are about 75 members who represent industry
21 as a whole that have an interest in gas piping systems,
22 steel suppliers, the utilities, a member of the Federal
23 Power Commission and the Railroad Commission of the State
24 of Maryland along with several professors and other experts
25 in certain lines from universities

26 Q And is there a portion of that group of 75 that did

1 more work than the others?

2 Was there a working committee or a subcommittee?

3 A That is always the case, I think in any large group

4 Q Yes, and did you participate in that?

5 A Yes, as a subchairman in the group, subchairman of
6 storage and pipe I attended the subchairman meetings as
7 well as the general meetings of the committee

8 Q I see. And how frequently did they meet? Do you
9 know?

10 A They would usually meet about once in between the
11 general meetings of the whole committee to program the
12 general meeting and then arrange the agenda

13 EXAMINER EDWARDS: You may proceed, Mr. Evers

14 MR. EYERS: In your construction of the line will the
15 welds be identified by die stamping?

16 A No It has been our practice since we started buying
17 the cold worked or expanded pipe to use stencils and paint
18 the identification number of the welder on the pipe.

19 Q What limit will be placed on out-of-roundness of
20 pipe?

21 A There is no limited established in the specifications.
22 The specifications for the pipe API-5-LX-52, which is used
23 by industry for this kind of material, states that the
24 diameter shall not be less than one thirty-second inch
25 smaller or greater than three thirty-second inch larger than
26 the tabulated outside diameter for a distance of four inches

1 from each end of the pipe as measured with a diameter
2 tape

3 That means that even though the pipe were egg
4 the internal line-up clamps which we use could bring it
5 back so that you would have the ends abutting suitably
6 close for welding

7 Now, we will be agreement with the manufacturer
8 arrive at some tolerance which we hope will be in the
9 neighborhood of 3/4 of an inch maximum, but we do that
10 by agreement, not in the specifications.

11 Q Will all welders be required to be requalified
12 before working on this pipeline installation?

13 A Yes, they will be required to requalify under the
14 requirements of API.

15 MR. MORRISSEY: What does that mean?

16 A That is the American Petroleum Institute, Standard
17 1104.

18 The title is Standard for Field Welding of Pipelines.

19 MR. EYERS. What percentage of welds will be inspected
20 radiographically and then by destructive testing?

21 A Radiographically between 5 and 10 percent taken at
22 random along the line. By destructive testing, probably
23 very few. We do that only for cause, for some specific
24 reason which we hope doesn't develop.

25 Q At critical points, such as river crossings, will
26 you make 100 percent radiographic inspection?

1 A Yes It is our practice at all tie-in welds or
2 welds to fittings or river crossings to radiograph the
3 complete welds, all of the welds.

4 Q What steps will be taken to insure that welds by
5 all welders will be inspected?

6 A We will have qualified welder inspectors present
7 when welding is done on the line. There will be a welder
8 with the line-up crew or the tack welder and the stringer
9 bead. There will also be a welder at the hot pass, the
10 second pass, and then there will be a qualified inspector
11 at the firing line or where the finished beads are applied.

12 Q Will there be any particular method to insure that
13 you radiographically inspect welds made by each individual
14 welder in your sampling procedure?

15 A Yes, I would say yes we will

16 Q What procedure will be used to test repaired defects
17 as defined in the Code?

18 A At the mill, of course, the pipe sections themselves
19 will be retested hydrostatically. In the field we will have
20 a written procedure to repair, for repairing defects and
21 those of course are minor defects, otherwise they are cut
22 out of the line entirely.

23 A section of pipe is taken out. There will be no
24 tests there other than visual inspection unless there is
25 a question on the part of the inspector, and then he might
26 call for a radiograph. He still isn't sure it will be cut

1 out The procedure is right so that it can be inspected
2 visually or we don't want to repair it, one or the two.

3 Q Have construction specifications for installations
4 been established?

5 A No, not for this project, although they will be
6 similar to the project we have had before, to the projects
7 we have had before.

8 Q At such time as we are established will you be
9 willing to make them available to the staff or the
10 Commission?

11 A Yes, I see no reason why the specifications can't
12 be made available

13 Q Will miter welds be used in the construction of
14 this line?

15 A No

16 Q Will dents up to a quarter inch deep be allowed
17 to remain in the pipeline?

18 A That depends. If it is a sharp dent, more of a
19 nick or something that is obvious which may occur from a
20 blow or perhaps some sharp instrument, or a hammer, I
21 would say that might be removed, in all probability it
22 would be removed, if it extends over quite a surface. A
23 dent up to a quarter of an inch can be a rather small thing
24 and it might be overlooked, or we might let it go

25 Q General gouges and things of that nature would be
26 removed?

1 A We are quite proud of this line, as you know We
2 are very careful of those We don't want anything like
3 that to get in

4 Q Will the pipe be bent on the job?

5 A Yes.

6 Q Will this be a smooth bend?

7 A Yes.

8 Q And will you also use cold wrinkle bends?

9 A No

10 Q Will you make any bends on the circumferential
11 welds?

12 A No. The specifications will require at least two
13 feet from the end of the field bend to a circumferential
14 weld.

15 Q What protection will be provided against external
16 corrosion in addition to the latter protection that was
17 mentioned this morning?

18 A All of the buried pipe and fittings will be given
19 two coats of asphalt with two saturater felts plus the
20 primer, and of course the primer coat is on the pipe prior
21 to application.

22 Q And then a final wrap of kraft paper?

23 A No In all probability this will be yard wrapped.
24 It depends on the contractors method of installing the line,
25 but we rather think it will call for yard wrapping. In
26 that case we don't use the kraft We use the two felts.

1 The outer felt has a coating of asphalt and mica finish
2 on the surface, and that is when it is washed to protect
3 it from the heat and also to show up any abrasions that
4 might occur between the yard and the installation

5 Q Will crossings of all roads, highways, streets
6 and railways be -- will they be in casings?

7 A No. State highways and railways will, and it
8 is possible that a few secondary highways, but generally
9 we will use heavier pipe where we cross the secondary roads
10 or the unimproved roads

11 Q How will the protective coating be inspected and
12 tested?

13 A There will be inspectors in the yard to inspect
14 the yard wrapping, and we will have wrapping inspectors in
15 the field to examine all field wraps, repairs to the yard
16 wrap and wrapping of fittings, and things like that.

17 They will be present when any wrapping is done.
18 It is also their responsibility to see that the bottom
19 of the ditch is properly prepared for the pipe, no rocks,
20 and that the padding in the ditch is proper and the back-
21 fill immediately around the pipe is also free of stones,
22 or other articles that might damage the pipe wrapping

23 Q Will their inspection be purely visual?

24 A Purely visual You see, if the contractor uses
25 the construction method he will be laying the piping in
26 the ditch a joint at a time, bell-hole method, and it is

1 difficult and impractical to use a holiday detector with
2 the pipe laying on the ground or in the ditch. We have
3 used them, but we don't feel it is necessary with our type
4 of wrap if we have good inspection.

5 Q Will the pipeline be purged with inert gas?

6 A No. Although there will probably be a slug of
7 inert gas introduced at the point where we are going to
8 open the valve to purge it with gas so that there will
9 be inert gas between the air and the gas as it travels
10 down the line.

11 Q What inert gas?

12 A Probably exhaust gas from air compressors.

13 Q Primarily carbon monoxide?

14 A No. It will be some, there will be some carbon
15 monoxide but not primarily

16 Q Will the tie-in welds between sections be tested?

17 A. Most of the tie-in welds will be tested when we
18 strength test the section of main because they will occur
19 within the sections, near the ends and at certain fittings
20 perhaps they will not be tested. They will be radiographed,
21 though, to see that they are structurally sound.

22 Q What fluid will be used for strength testing where
23 you do test them?

24 A In those areas that are classified as Class I
25 locations we will use gas which is permitted under the Code,
26 210 percent of the maximum allowable working pressure. In

1 the northerly section north of pressure limiting station
2 No. 7 to Milpitas we will use water and hydro statically
3 test that section.

4 Now, should the house count develop Class II
5 location anywhere else on the line we will probably hydro-
6 statically test that too, although we are investigating
7 the practicability of getting air compressors that will
8 give us the pressure we need for testing. We don't know
9 yet whether it is practical to obtain them or not

10 Q That will primarily be an economical determina-
11 tion?

12 A Yes.

13 Q Will the test pressure you mentioned a minute
14 ago be used for testing?

15 A That is the desert, or the open country. The
16 section immediately south of Milpitas will immediately be
17 tested to one and a quarter times the working pressure as
18 required by Class II location in the Code.

19 MR. MORRISSEY: What part of the Code are you
20 referring to, Mr. Smith?

21 A Table 841.412-D on page 49

22 MR. EYERS: How will this testing be accomplished
23 when you are in the process of testing this line?

24 A. After the line is pressured and prior to placing
25 it in service we will put pressure charts on the sections
26 and observe those for a period of 24 to 48 hours and see

1 if there is any noticeable change, and we will patrol the
2 line very frequently looking for any surface indications
3 or leaks, and of course we will pick up some of these
4 smaller leaks perhaps in the springs, dry grass and other
5 means; perhaps we will have the combustible indicators
6 that we use too. Those leaks are very small. They are
7 not hazardous. Many of them are so small you can't
8 justify repairing them on an economical basis.

9 Q I gather, then, that all the leaks would not
10 necessarily be eliminated?

11 A No. It would be prohibitive to eliminate all
12 of them.

13 Q What spacing will be used for block valves,
14 valve installations?

15 A They will vary considerably. I would say generally
16 from about five miles to perhaps 15 as a maximum.

17 Q What arrangements for blowing down the main between
18 block valves will be made?

19 A There will be 12-inch blow-down valves with piping
20 on each side of each main line valve, and then there will
21 be 12-inch intermediate blow-down valves as required,
22 depending on the length of the section.

23 Q How long do you estimate it would take to reduce
24 the pressure in a section of main where you have your
25 maximum spacing between block valves and the main is carry-
26 ing its maximum operating pressure?

1 A Generally we allow 30 to 40 minutes in the design,
2 that is, in placing the blow-down valves and intermediate
3 blow-down valves. We do it so that we can blow a section
4 down in about a half hour. That has been checked in
5 practice

6 Q In the course of your plans for construction are
7 there any places where you are exceeding the requirements
8 of the Code?

9 A No. I would say in all cases we are probably
10 bettering the Code requirements a little bit.

11 Q That is in the majority of spots so it would
12 become impractical to point out the areas where you are
13 bettering it?

14 A Well, one location is the weight of the pipe,
15 I think, coming into Milpitas from pressure limiting
16 station 7, which I think the Examiner mentioned earlier
17 in the hearing. We will probably test that in excess
18 of the requirements of the Code and we have added wall
19 thickness in there because of the anticipated growth in
20 that area

21 We will use sections of heavier wall pipe rather
22 frequently down through the area if we have any reasons
23 to expect there will be corrosion development and at
24 road crossings and places I think our construction has been
25 on the conservative side.

26 MR. EYERS: Well, that is all I have of Mr. Smith

1 EXAMINER EDWARDS: Any other questions?

2 (No response)

3 EXAMINER EDWARDS: Apparently not, Mr. Smith Thank
4 you very kindly for your testimony.

5 Now, is the Applicant ready to submit the case?

6 MR. MORRISSEY: Yes, Mr Examiner. I would like to
7 just seek by perhaps short reiteration to emphasize the
8 request that Mr. Beckman made for an early decision. I
9 recognize the time for the Commission to act is short, but
10 I trust that your work and the work of others in the
11 Commission in preparing the decision, that they will take
12 into account the need for prompt action, particularly in
13 view of Mr Beckman's testimony as to our problems of
14 getting this 34-inch out-of-diameter pipe, which is as I
15 understand it only manufactured in this country at this
16 time by the Consolidated Western Steel Division of the
17 United States Steel Company with their plant at Utah I
18 think that the evidence has demonstrated fully the state-
19 ments made in our third amended, or amended third supple-
20 mental application and that in view of the fact there have
21 been no protests or opposition of any sort made to our
22 request that there is no need for an extended discussion
23 on my part at this late hour.

24 Thank you for your attention.

25 EXAMINER EDWARDS: The applicant is willing to submit
26 on the record as made?

1 MR. MORRISSEY. That is right.

2 EXAMINER EDWARDS: Very well, and you will submit
3 a copy of the FPC decision?

4 MR. MORRISSEY: As promptly as we can get it to you.

5 EXAMINER EDWARDS: And Exhibit No, SB-11?

6 MR. MORRISSEY: That is correct

7 EXAMINER EDWARDS: Very well Anything further to
8 come before us?

9 (No response)

10 EXAMINER EDWARDS: Anybody wish to express an objection
11 to the proposal as made today?

12 None appearing, the matter will be submitted for
13 Commission decision. We stand adjourned.

14 (Whereupon, at the hour of 4:45 p.m , the above
15 matter having been submitted, the Commission
16 adjourned)

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