Decision No. _____ ORIGINAL

Decision No. 42-88

BEFORE THE RAILROAD COMMISSION OF THE STATE OF CALIFORNIA.

In the Matter of the Application and Effect of the Rates, Rules and Regulations to be Charged and Applied by San Joaquin Light and Power Corporation, as Established by Decisions No. 3241 and No. 3277 of the Railroad Commission.	Case No. 1042 (On the Railroad Commission's Own Motion)

Short and Sutherland for San Joaquin Light and Power Corporation.

THELEN, Commissioner.

O P I N I O N

This is a proceeding initiated by the Railroad Commission on its own motion, for the purpose of examining into informal complaints which have been made, affecting the rates, rules and regulations of the San Joaquin Light and Power Corporation, hereinafter called the San Joaquin Corporation, as established by the Railroad Commission in what is commonly known as the "San Joaquin Case". The decision in that case was rendered

202

on April 6th, 1916, and the decision on re-hearing on April 22nd, 1916. The rates, rules and regulations established by the Railroad Commission in that proceeding were, to a considerable extent, different from those which had theretofore existed. During the first nine months of operation under the new schedules, with which neither the company nor its consumers were entirely familiar, difficulties have arisen between the San Joaquin Corporation and certain of its patrons both in connection with the application of the new rates and in otherwise carrying out the intent of the Commission's Decision Number 3241 (Vol. 9, Opinions and Orders of the Railroad Commission of California, p. 542) and of Decision Number 3277 on petition of the San Joaquin Corporation for rehearing (Vol. 9, Opinions and Orders of the Railroad Commission of California, p. 776).

The Commission considered it advisable to hold public hearings for the purpose of receiving the complaints and suggestions of consumers of the San Joaquin Corporation concerning matters involved in the original proceedings and the effect of a season's application of the new schedules. It was also thought advisable to consider at this time all the unadjusted informal complaints against the San Joaquin Corporation.

Public hearings were held in Bakersfield on February 23, 1917, and in Fresno on February 24, 1917. The proceeding was submitted on the latter date with the understanding that certain data which had been called for by the Commission and other data offered by

the San Joaquin Corporation might be filed later and considered as part of the evidence in this proceeding.

At the time this proceeding was submitted, the following exhibits had been filed by the respective parties:

Consumers of the San Joaquin Corporation, Exhibit No. 1.
San Joaquin Corporation, Exhibits No. 1 and No. 2.
Railroad Commission, Exhibit No. 1.

By stipulation the following documents bearing upon the issuesof this case are considered as being in evidence without the assignment of formal exhibit numbers:

Annual Report of the San Joaquin Light and Power Corporation for the year ending December 31st, 1916.

The evidence in Application No. 1666, in so far as pertinent herein.

Informal complaint files referred to by number in Railroad Commission's Exhibit No. 1, herein.

Agreement dated May 22nd, 1915, between Westinghouse Electric and Manufacturing Company and San Joaquin Light and Power Corporation, together with the supplemental proposal of the same date.

Letter dated March 31st, 1916, from Westinghouse Electric and Manufacturing Company to the San Joaquin Light and Power Corporation, containing revision of prices of Westinghouse distribution transformers.

Letter dated May 27, 1916, from Westinghouse Electric and Manufacturing Company to Mr. J. H. Newlin, Purchasing Agent, of San Joaquin Light and Power Corporation, referring to future delivery order of distributing transformers.

Letter dated November 28th, 1916, from W. E. Durfey, Office Assistant to General Manager, San Joaquin Light and Power Corporation to Railroad Commission with enclosures.

Letter dated January 9th, 1917, from R. F. Behan, Manager Supply Division, Westinghouse Electric and Manufacturing Company to Railroad Commission, with enclosures.

It was further stipulated that such documents as might be filed by the parties subsequent to the hearings herein should be considered as evidence. The following documents have been filed by San Joaquin Corporation, have been given the exhibit numbers indicated, and will be considered as being in evidence in these proceedings:

Exhibit No. 3 - Report of progress in correcting voltage conditions in Bakersfield.

Exhibit No. 4 - Report of consumption at pumping plant of Dr. C. W. Kellogg, January, 1912 to December, 1916.

Exhibit No. 5 - Record of service interruptions in McFarland District from July 3rd, 1916, to January 31st, 1917.

Exhibit No. 6 - Correspondence with reference to purchase of transformers from Wm. Burchett.

Exhibit No. 7 - Details of San Joaquin Corporation's method of computing consumers' transformer values.

Exhibit No. 8 - Report of Engineering Department of San Joaquin Corporation concerning transformer failures, classified by manufacturers' types.

Exhibit No. 9 - Supplementary report on correcting voltage conditions in Bakersfield.

Exhibit No. 10 - Report concerning transformers considered by San Joaquin Corporation to be below standard.

Exhibit No. 11 - Copy of letter from C. E. Heise, District Manager, Westinghouse Electric and Manufacturing Co., to Mr. J. H. Newlin, Purchasing Agent, San Joaquin Light and Power Corporation, referring to extension of transformer contract.

Exhibit No. 12 - Installation of maximum demand meters on irrigation consumers and variations of demand with time after starting pumping motors.

The following additional exhibit was filed by the consumers of the San Joaquin Corporation and will be considered in evidence:

Exhibit No. 2 - Contract between Central California Land and Improvement Company and San Joaquin Light and Power Corporation, dated March 17, 1916.

A detailed report on certain tests concerning which Mr. J. F. Pollard, of the Railroad Commission's Engineering Department, testified at the Bakersfield hearing, has been prepared and filed herein as Railroad Commission's Exhibit No. 2.

The matters concerning which complaint was made herein, may be divided into several general subjects which will be considered in the order indicated. In a few instances individual complaints will be considered as special cases and these will be discussed along with the general subject to which they are most closely related.

I PURCHASE OF CONSUMERS' TRANSFORMERS:

1. Prices offered for standard types.
2. Types of transformers considered below standard and prices offered for same.
3. Purchase of transformers previously replaced by San Joaquin Corporation.

II MINIMUM GUARANTY FOR DOMESTIC SERVICE FROM RURAL DISTRIBUTING LINES

III SERVICE EXTENSIONS

IV SELECTION OF THE PROPER SCHEDULE IN CHANGING FROM THE OLD TO THE NEW SYSTEM OF RATES.

V EFFECT OF THE USE OF MAXIMUM DEMAND METERS:

1. Adjustment on the 94% demand factor and effect of abnormal demands.
2. Time interval.
3. Determination of demands where meters are not available.
4. Demand charge for pit lights.

VI SEASONAL SERVICE:

1. Determination of date upon which season shall start.
2. Additional service beyond season contracted for.

VII VOLTAGE CONDITIONS IN EAST BAKERSFIELD

VIII MODIFICATION OF OTHER SCHEDULES AND RULES:

1. Off pumping season service for agricultural consumers.
2. Rates for agricultural consumers whose load factor is low.
3. Seasonal industrial minimums.

IX SERVICE INTERRUPTIONS

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I

PURCHASE OF CONSUMERS' TRANSFORMERS

1. Prices Offered for Standard Types

In said decision No. 3241, this Commission at page 568, said:

> "The rates herein prescribed are established on the assumption that the San Joaquin Corporation will take over, under equitable conditions, all transformers now on its system and heretofore paid for by its consumers. * * * * It is suggested that payment for the existing transformers may be made under uniform rules and regulations by crediting the consumers with a fixed percentage of the fair value of the transformers on the consumer's bills, month by month until the transformers are fully paid for."

In accordance with this suggestion, the San Joaquin Corporation, on May 1, 1916, made effective its Rule No. 22, which is in part as follows:

> "Where a transformer is owned and now used by a consumer in connection with service being supplied by the Company, the Company will, under normal conditions, purchase such transformer at the current price paid by the Company for such type of transformer, less 5 per cent per annum for depreciation. Such price when agreed on shall be paid in the following manner:
>
> "Said consumer shall be paid therefor by receiving, until said purchase price is fully paid, a credit on the consumer's account with the Company equal to or not less than ten per cent of the amount payable each month by the consumer for electric service from the Company, * * *."

The method outlined in this rule resulted in much complaint from the consumers. Thereafter, the San Joaquin Corporation applied to the Railroad Commission for permission

to issue bonds to cover the outright purchase for cash of the transformers owned by its patrons. The Railroad Commission, in its decision No. 3489 made on July 7, 1916, granted the application. (Vol. 10, Opinions and Orders of the Railroad Commission of California, p. 536). At page 542, the Commission said:

> "Table No. IV includes an item of $232,000 to cover the cost of transformers to be purchased by San Joaquin Light and Power Corporation from its consumers, as directed by the Railroad Commission in said Decision No. 3241. San Joaquin Light and Power Corporation has heretofore undertaken to pay for said transformers by a credit of 10 per cent of the consumers' monthly bills. The consumers, however, prefer to have San Joaquin Light and Power Corporation purchase the transformers outright, and the Corporation desires to be in a position to do so. Some dispute having arisen between the Corporation and its consumers with reference to the price to be paid for the transformers, the Railroad Commission recommends that the corporation pay for them outright, the sum to be paid in each instance being the price which San Joaquin Light and Power Corporation would be compelled to pay for the transformer at the present time, new, less depreciation at the rate of 5 per cent per annum."

In carrying out this recommendation, San Joaquin Corporation has fixed a base price for transformers equivalent to that at which San Joaquin Corporation would have been able to buy them new laid down at their storerooms, either in Bakersfield or Fresno, and from the price so ascertained San Joaquin Corporation deducts the value of all oil in the transformers. The price thus determined is then further reduced by deducting depreciation at the rate of 5 per cent for each year during which the individual transformer has been in service. In certain cases where abnormal depreciation has occurred, due to accidents or other causes, an additional deduction has been made therefor. No allowance

has been made for the cost of delivering the transformer to the consumer's premises nor for the labor and material of installing the same. In support of this basis of valuation, San Joaquin Corporation urges that in the past, even though consumers owned their transformers, it was the practice of the Corporation to make regular inspections of them and whenever necessary to replace at its own expense such oil as had been lost through leakage and other causes.

The question of transformer values herein applies primarily to agricultural consumers, since it was a uniform rule that consumers of this class furnish transformer equipment at their own expense. San Joaquin Corporation's Exhibit No. 64 in Application No. 1666, shows agricultural consumers distributed in the districts as follows:

TABLE I

Agricultural Consumers

District	Number Consumers	% of Agricultural Consumers	Agricultural consumers' connected H. P.	% of total Agricultural consumers' connected H. P.
Merced	63	8.1%	671.5	7.4%
Corcoran	159	20.6%	1 637.5	18.1%
Madera	105	13.6%	1 131.0	12.5%
Bakersfield	203	26.2%	2 871.0	31.8%
Taft	2	.2%	55.0	.6%
Los Banos	18	2.3%	617.5	6.8%
Selma	22	2.8%	150.5	1.7%
Dinuba	159	20.6%	1 338.0	14.8%
Fresno	43	5.6%	575.0	6.3%
Total	774	100.0%	9 047.0	100.0%

San Joaquin Corporation's Exhibit No. 1 herein shows the estimate of various district agents as to the amount of oil which has been replaced in consumers' transformers by the Corporation in the several operating districts, as follows:

Los Banos	20%
Madera	small amount
Bakersfield	25%
Other districts	no report

In view of the fact that such oil as was replaced by the San Joaquin Corporation was charged to operating expenses and paid for by the consumers through the medium of rates, there appears to be no justification for deducting at this time the cost of oil originally purchased by consumers when transformers were installed, in valuing this equipment for the purpose of purchase.

San Joaquin Corporation urges that it should not be required to pay anything for the delivery and installation of these transformers because in many cases they were originally installed at the Corporation's expense. District agents of the utility have estimated the proportion of consumers in their respective districts who originally paid for the cost of installation as shown in San Joaquin Corporation's Exhibit No. 1 herein as follows:

TABLE II

Installation of Transformers

District	Percentage of consumers in District Required to Pay for Installation	Percentage of System Agricultural Consumers in District	Percentage of Agricultural Consumers on System Required To Pay For Installation
Los Banos	50%	6.8%	3.4%
Madera	10%	12.5%	1.3%
Fresno	Practically none	6.3%	.0%
Bakersfield	1%	31.8%	.3%
Selma	No record of any	1.7%	.0%
Dinuba	85%	14.8%	12.6%
Merced	Very small	7.4%	.0%
Corcoran	No Report	18.1%	No Report
Taft	No. Report	.6%	No.Report
Total		100.0%	17.6%

Even if it is assumed that in the districts from which reports were not received, none of the consumers paid for the cost of installation, there are still, on the corporation's own showing, a very considerable proportion of their agricultural consumers who did ~~not~~ bear this expense.

It is necessary to establish some definite point from which to start in all cases involving the valuation of property, and, bearing in mind the consumer's right to refuse to sell and to demand that San Joaquin Corporation substitute its own equipment for the consumer's transformers, the basis which appears to be fairest to both parties is that suggested in the aforesaid Decision No. 3489, viz.:

> "The price which San Joaquin Light and Power Corporation would be compelled to pay for the transformers at the present time, new, less depreciation at the rate of 5 per cent per annum."

In the interpretation of this basis, however, the price should clearly be determined as the cost in place on the consumer's pole and not the cost delivered at the Corporation's Division store rooms.

An allowance of 5 per cent per annum for depreciation is based upon an assumed average life of such transformers, including those which last longer than 20 years, as well as those which fail earlier, and in valuing this equipment no deductions should be made except, possibly, in exceptional cases, for abnormal depreciation beyond that based on the actual age of the

equipment in service.

Inasmuch as the rates established in this Commission's Decision No. 3241, effective May 1, 1916, were intended to cover depreciation on all transformer equipment necessary to serve San Joaquin Corporation's consumers, no depreciation should be deducted after that date.

The order of this Commission requiring the San Joaquin Corporation to furnish all necessary transformer equipment became effective on May 1st, 1916. San Joaquin Corporation's Exhibit No. 1 herein, shows that from May 1st, 1916, to February 20th, 1917, 1,284 transformers were purchased, or 37.3 per cent of the 3,452 which were owned by consumers on the former date. The Commission realizes that considerable clerical work and field inspection is required in handling this transfer. A reasonable time for doing this work has now elapsed and beginning with the effective date of this Decision, and thereafter, San Joaquin Corporation should pay 6 per cent interest per annum on the value ascertained as herein indicated, of all transformers which are at that time owned by its consumers, and which are then used in connection with service furnished under rates which contemplate the ownership of transformer facilities by the utility.

It is impractical to determine the exact cost of hauling and installation in each individual case, and the transformer values determined herein will include average costs for these items, corresponding to those costs used in the valuation of San Joaquin Corporation's property, and considered in connection with the establishment by the Commission of the present rates.

Giving due consideration to the contract between San Joaquin Light and Power Corporation and Westinghouse Electric and Manufacturing Company for the purchase of distribution transformers, I find that the following values are a fair basis upon which San Joaquin Corporation should purchase its consumers' transformers of standard types. The only deduction therefrom should be 5% per annum during the period between date of original installation and May 1, 1916. Consumers who have sold their transformers to San Joaquin Corporation for a less amount are entitled to a credit in the amount of the difference between the amount received and the values shown in the following table:

TABLE III

Fair Basic Value for Transformers

Size K.V.A.	2300 - volt Transformers		6600 - volt Transformers		11,000 - volt Transformers	
	Northern Division	Southern Division	Northern Division	Southern Division	Northern Division	Southern Division
1	24.06	24.81	44.42	45.99	60.49	62.21
1-1/2	28.60	29.49	48.50	50.24		
2	32.89	33.94	53.24	55.11		
2-1/2	36.64	36.78	57.96	59.97	91.24	93.09
3	40.60	41.89	60.46	62.58		
4	48.70	50.29	68.15	70.59		
5	56.58	58.40	77.39	80.09	116.30	119.63
7-1/2	73.91	76.31	97.21	102.56	135.46	139.38
10	91.34	94.24	116.61	120.64	150.01	154.36
15	124.80	129.07	154.03	158.19	184.05	189.40
20	153.64	158.89	182.61	188.91	213.06	219.24
25	182.72	188.93	215.04	222.36	246.95	254.07
30	208.96	216.02	242.37	250.70	271.51	279.36
37-1/2	245.24	253.52	278.58	287.77	311.59	320.61
50	303.81	314.00	345.16	357.01	370.35	380.97
75					467.02	480.29
100					544.54	560.07

2. Types of Transformers considered ~~sub~~-standard and prices offered for same:

The evidence in regard to the experience of San Joaquin Corporation with the operation of transformers of the various types of manufacture which were in service on its system during the years 1914 and 1915, indicates that there has been a variation in the number of transformer failures proportional to the total number of transformers of each type in service as listed in the following table:

TABLE IV

Transformer Failures

Manufacturer	Number of Transformers Installed 1914	1915	Number of Failures 1914	1915	Average Percentage of Failures 1914 & 1915
General Electric	1 747	1 873	95	34	3.61%
Westinghouse	2 844	3 315	153	78	3.75%
Crocker-Wheeler	63	99	7	4	7.57%
Maloney	141	308	20	10	8.72%
Allis-Chalmers	73	75	25	12	21.1%
Wagner	8	11			0%

Because of the characteristics of insulation and design of the transformers listed in Table IV and because of the indicated performance of the different types, San Joaquin Corporation has accepted the cost and performance of General Electric and Westinghouse equipment as standard, and has been offering consumers 100 per cent of the base value for transformers of these types, less normal depreciation based on age. For other classes of equipment San Joaquin Corporation has established a

basis of further or additional depreciation on the ground that these other types of transformers are not properly designed for satisfactory operation under the conditions existing on its system. It is claimed that if they are required to pay more for these transformers, the company would be justified in substituting standard equipment of its own, leaving the consumer to make such disposition of his transformer as he might see fit.

San Joaquin Corporation proposes to pay consumers who own transformers of these types, which have been classed by the company as below-standard, the following percentages of the cost of standard equipment:

Maloney Transformers	60%
Crocker-Wheeler Transformers	45%
Allis-Chalmers Transformers	20%
Wagner Transformers	60%

The principal cause of the unsatisfactory performance of certain types of transformers. appears to be more a matter of misapplication rather than faulty construction of the transformer units, that is to say, transformers which were designed to operate properly on a 6,600 volt, single phase or delta system, were installed by San Joaquin Corporation upon a 10,000 volt grounded star system. The evidence shows that the manufacturers of each of these so-called substandard types of equipment have since placed on the market transformers designed for operation on a system of this nature. These later types have been found to be entirely satisfactory, and in fact San Joaquin Corporation's recent purchases include new equipment manufactured by these same companies.

Undoubtedly some of those transformers have been made to operate satisfactorily as indicated by the fact that the transformer failures in 1915 decreased 60-1/2% as compared with those during 1914. This improvement in service performance is undoubtedly due in part to repairs and the reinsulation of transformers and in part to the elimination of ground wires, and other alterations, and general improvements in the system.

Inasmuch as the so-called sub-standard equipment on the lines of the San Joaquin Corporation increased almost 73% from 1914 to 1915, it cannot reasonably be contended that the utility has made an effort to discourage the use by its consumers of certain types of transformers. Failure on the part of the utility to require certain standards of equipment to be operated as part of its system must be considered as, at least, tacit approval of such equipment and hence it would not be reasonable for the utility to later discriminate against certain makes of transformers because of a more or less arbitrary standard which has since been adopted.

It must be admitted that some of the earlier types of transformers were not suitable for operation on the 10 K.V. lines of San Joaquin Corporation and it is not considered proper or to the best interests of the patrons of that utility to require the purchase by it of equipment essentially unsuitable or unsatisfactory from an operating standpoint. There is, however, no reason to assume that transformers installed by consumers of San Joaquin Corporation since January 1, 1915, should not all be classed as standard equipment for the purpose of arriving at an equitable

purchase price.

In view of the facts herein related it is considered just and proper for San Joaquin Corporation to acquire the transformers heretofore owned by its consumers on the basis set forth in the following table:

TABLE V

Basis for Arriving at the Fair Value of Consumers' Transforms for use on 10 K.V. Lines

Make of Transformer	Transformers Installed prior to Jan.1, 1915	Transformers Installed Subsequent to Dec. 31,1914	All transformers other than those for use on 10 KV Lines
General Electric	100%	100%	100%
Westinghouse	100%	100%	100%
Wagner	100%	100%	100%
Maloney	70%	100%	100%
Crocker-Wheeler	57-1/2%	100%	100%
Allis-Chalmers	37-1/2%	100%	100%

In particular cases where either the utility or the consumers owning transformers believe that an undue hardship will result from the application of the basis of valuation indicated in Table V the matter should be referred to the Commission for final action. It should be further pointed out that any consumer who does not consider the prices herein established to be satisfactory, has the right to dispose of his transformers in any other manner in which he sees fit, whereupon San Joaquin Corporation will substitute its own equip-

ment.

One consumer, Mr. John J. Peters, testified that in 1915 he had made arrangements to purchase equipment for a 5 horsepower installation, including a three phase motor and Westinghouse transformers. San Joaquin Corporation at that time refused to supply a plant of this size with three phase service and this action on the part of the company required Mr. Peters to cancel his order for motor and transformers. The only single phase, 5 horsepower motor upon which Mr. Peters was then able to obtain delivery was one manufactured by the Wagner Electric Company. He proceeded to purchase this, together with a Wagner transformer for the service of the same, at an increased cost to him of $36.00, and with the full knowledge and acquiescence of the agents of the San Joaquin Corporation. Mr. E. B. Walthall testified that in April, 1916, San Joaquin Corporation first filed its rule providing that motors of 5 horsepower capacity and less must be single phase, although it was the practice of the company to enforce this requirement more or less rigidly prior to that time. In view of these circumstances and of the fact that this transformer was installed subsequent to January 1, 1915, the San Joaquin Corporation should purchase this transformer as standard equipment.

3. Purchase of Transformers previously Replaced by San Joaquin Corporation

Mrs. Louise D. Tennant, a witness who testified at the Fresno hearing, stated that on July 7th, 1913, she had purchased and installed upon her ranch near Corcoran, three 10 kilowatt Maloney transformers, and about one month later, during an electrical storm, these were all destroyed. San Joaquin

Corporation, not being able to trace the failure of this equipment to any fault of the consumer, replaced the same at its own expense, installing Westinghouse transformers for this purpose. The testimony of the officers of San Joaquin Corporation shows that transformers so destroyed were usually removed by the Company and disposed of as junk. The money realized from such sale was not turned over to the original owner of the equipment which was destroyed. San Joaquin Corporation now proposes to purchase Mrs. Tennant's transformers paying for them the reduced price which would be offered were the original Maloney transformers now in service.

San Joaquin Corporation substituted the Westinghouse transformers for the Maloney transformers which were originally furnished by the consumer, and which had been destroyed through accident due to inherent conditions in the operation of the Corporation's electric system. The ownership of the new transformers then passed to the consumer and San Joaquin Corporation assumed the ownership of the old transformers and proceeded to dispose of the same, retaining the remuneration received therefor. In view of the facts as stated, it appears that Mrs. Tennant now owns three Westinghouse transformers and that the same should be purchased from her by the San Joaquin Corporation at the price paid to other consumers for similar equipment.

Mr. C. L. Ripperdam, another witness, presented a precisely similar complaint, except that the transformers which he originally installed were of the Allis-Chalmers type, and only two of these were later destroyed and replaced by San Joaquin Corporation with Westinghouse equipment. These two transformers should be purchased by San Joaquin Corpora-

tion in accordance with prices paid for standard Westinghouse equipment.

If there are other similar instances which were not brought to the Commission's attention, they should, of course, be handled in the same manner.

II

MINIMUM GUARANTY FOR DOMESTIC SERVICE FROM RURAL DISTRIBUTING LINES

In said Decision No. 3241, the presiding Commissioner, at page 620, said:

> "After careful examination of the evidence herein, I have reached the conclusion that a reasonable minimum for residence lighting service charged by San Joaquin Corporation is 75 cents per meter per month"

It appears that San Joaquin Corporation has proceeded to charge such a minimum for residence lighting in all of the towns and cities which it serves. In rural territory, however, where it is necessary in most instances to install a transformer

for each individual consumer, the cost of such installation is greater than San Joaquin Corporation considers justified by a revenue of only 75 cents per month. Accordingly on July 5th, 1916, San Joaquin Corporation filed its Rule No. 48, providing in part that,

> "If an applicant, who is legally entitled to receive service and whose premises upon which such service is desired are located in unincorporated territory and along an existing distributing main of the Company, makes application, as outlined in the Company's rules and regulations, for service for small power and lighting purposes and executes a three year contract, the Company will install a service connection from its distributing main to the first point of support on the premises, as selected by the Company, and install the necessary transforming capacity and supply thereat its electric service at 110 volts or 220 volts; * * * provided, however, that the monthly minimum bill for such service shall be as follows:
>
> "$2.50 per consumer, if a 2-1/2 kilowatt transformer is used and one consumer served therefrom,
> 2.25 per consumer, if a 2-1/2 kilowatt transformer is used and two consumers are served therefrom,
> 2.00 per consumer, if a 2-1/2 kilowatt transformer is used and three consumers are served therefrom,
> 2.75 per consumer, if a 5 kilowatt transformer is used and one consumer is served therefrom.
> 2.20 per consumer, if a 5 kilowatt transformer is used and two consumers are served therefrom.
> 2.00 per consumer, if a 5 kilowatt transformer is used and three consumers are served therefrom."

In any application of this rule it should be clearly understood that the minimum guaranty so provided does not supersede or invalidate the 75 cent minimum charge, provided by the Commission for residence lighting service, but is simply

intended to provide that San Joaquin Corporation will not extend its service under the conditions outlined in the rule unless the total revenue shall equal that set forth in the rule. This use may be made up of a combination of residence lighting, cooking, heating and domestic motors or other uses.

It appears that San Joaquin Corporation, in attempting to carry out the order of the Commission, has offered to purchase transformers, used to serve consumers with residence lighting, in rural territory, only upon condition that the minimum guaranty provided in the aforesaid Rule No. 48 shall then apply to their service.

All of the existing consumers on May 1st, 1916, together with the average cost of serving them, were considered by the Commission in fixing the rates then established, and it was intended to provide that all residence lighting consumers then in existence should be granted the 75 cent minumum rate, and that all transformers then owned by the consumers of the San Joaquin Corporation should be acquired by it.

Sufficient time has not elapsed for an adequate observation of the effect of the rates established by the Commission for the San Joaquin Corporation to warrant, at the present time, any disturbance of the minimum rate therein provided. However, there can be no question but that a 75 cent minimum is proper in such centers of population as Fresno and Bakersfield. Whether a somewhat higher minimum charge would be proper in the smaller communities with a still higher minimum charge under such con-

ditions as those referred to in the aforesaid Rule No. 48 are matters which can better be determined after a fuller presentation of the facts than has heretofore been possible.

In view of the present high prices of transformers and copper wire, and the difficulty of obtaining deliveries at any price, together with the inadequate information now available, San Joaquin Corporation will be permitted, in connection with service extensions hereafter to be made, to proceed for the presentin accordance with said Rule No. 48. San Joaquin Corporation should, however, at once take steps to purchase the transformers, owned by consumers of this class, which were installed on its lines on May 1st, 1916, at the same time granting to such consumers the benefits of the standard rates without increased guarantees.

The attention of the Commission has been drawn to certain changes which have been recently made in the voltage delivered in the Selma and Kingsburg Districts. It appears that in order to increase the capacity of the lines in these particular localities, San Joaquin Corporation has increased the nominal operating voltage from 4,000 to 11,000 volts, which necessitates changing all 2300 volt transformers to others which will operate on the higher voltage circuits. The transformers, which were owned by the consumers in these Districts on May 1st, 1916, and which San Joaquin Corporation was then required to purchase, were the 2300 volt transformers then in service, and such of these as

have not already been taken over should he acquired by San Joaquin Corporation.

Any expense connected with the subsequent change in voltage should be borne by San Joaquin Corporation and charged to the increased capacity required to serve the additional business which made such change necessary.

III

SERVICE EXTENSIONS

The Commission has not yet found it feasible to establish a general rule defining free limits for service extensions in unincorporated territory. While it is naturally the desire of the Commission that a utility be as liberal as possible in the construction of extensions, consideration must also be given to the utility's financial condition and to the rights of existing consumers.

Two complaints with reference to service extensions were brought to the attention of ~~xxx-xxxxxxxxx-xx~~ the Commission in this proceeding.

Mr. S. S. Judd, who resides in unincorporated territory near the town of Del Rey, testified on behalf of himself and three neighbors, Mr. Hans Hansen, Mr. Harry Jolcumsen, and Mr. B. M. Lauritsen. These complainants are located on four small ranches adjacent to each other, the farthest of which is 2,640 feet from the nearest existing 10,000 volt line of the San Joaquin Corporation, and somewhat less than this distance from the nearest

secondary line which serves the town of Del Roy. The evidence shows that all of these parties have made application to the San Joaquin Corporation for electric service for lighting and domestic power purposes.

Under date of December 6th, 1916, Mr. M. E. Newlin, District Agent for San Joaquin Corporation, wrote to Mr. Judd stating that the corporation would extend its lines in order to furnish the desired service, providing that the entire expense of the same should be borne by the prospective consumers. San Joaquin Corporation stated that it would furnish the transformer and the meters at its own expense, and estimated the total cost of the line extension, exclusive of the transformer and meters and the labor of installing the same at $555.80.

In regard to extensions in unincorporated territory, this Commission, in its Decision No. 2879 in Case No. 683 (Vol. 8, Opinions and Orders of the Railroad Commission, p.372) adopted the following rule:-

> "A water, gas, electric or telephone utility shall make such reasonable extensions in unincorporated territory at its own expense, as it can agree upon with the applicant for service; provided, that in any case in which the construction of an extension at the utility's sole expense will in its opinion work an undue hardship upon the utility or its existing consumers, the matter may be submitted to the Commission as provided by Section 36 of the Public Utilities Act, unless satisfactorily adjusted by an informal application to the Commission."

It appears in this instance that the total cost of serving these four consumers, including transformers, meters

and all necessary equipment and labor, will amount to $757.17. I find that the increase in actual annual expense to San Joaquin Corporation which would be created by making the service extension as requested, not including any item of profit, will be covered by an aggregate annual gross revenue of $132.00, which is equivalent to $2.75 per month for each of the four consumers. The Commission has frequently drawn attention to the fact that it is unreasonable for utilities to urge that each extension constructed at their cost must be profitable in itself, and inasmuch as such a policy would lead to grave results in thwarting the development of this State such a contention cannot be sanctioned by the Commission. Mr. Judd has informally indicated his willingness and that of the other three interested parties to guarantee such a minimum of $2.75 per month, and under the circumstances San Joaquin Corporation should proceed to furnish this extension at its own expense as soon as each of these prospective consumers have signed a three year contract guaranteeing such a minimum revenue. The question as to whether this special guaranty should be continued in force at the end of the initial three year period may be left open for consideration at that time.

Mr. Edwin M. Einstein testified on behalf of the Central California Land and Improvement Company in regard to an extension of service to the La Sierra Tract, a new sub-division which was recently opened up by that company. It appears that a considerable

portion of the tract lies within the incorporated limits of the City of Fresno and that all electric distributing lines, which have up to the present time been constructed for its service, are within the city limits. Under date of March 17th, 1916, this complainant, under protest, entered into a contract with San Joaquin Corporation providing that the utility's lines should be extended to serve certain specified blocks within the tract. The total cost of such extension was to be paid for by the Central California Land and Improvement Company, and the entire gross receipts from such consumers as were served from this extension were to be turned over to the Central California Land and Improvement Company for a period of three years, provided that the aggregate of such gross revenue should not exceed the original cost of the lines within that period of time. This contract, together with certain correspondence regarding the same, is on file as Consumers' Exhibit No. 2 herein. Central California Land and Improvement Company's letter under date of March 16th, 1916, transmitting the signed copy of the contract to the San Joaquin Corporation, states in part,

> "Accordingly we have signed an agreement, which you will find enclosed, in which we agreed to pay $702.33, the cost of installing certain lines described in the agreement, with the provision that it shall be left to the Railroad Commission of California to determine whether we shall be restricted to the period ending July 1st, 1919, in receiving such revenue until fully reimbursed for the $702.33 spent."

In decision No. 2879 in Case No. 683, supra, this Commission established the following rule:-

"Except in the case of extensions in unincorporated territory, which matter is left open for consideration in subsequent proceedings, and of extensions in incorporated territory in cases in which the Commission may hereafter authorize the signing of contracts for service, a water, gas, electric or telephone utility may not require that an applicant sign a contract for service as a condition precedent to service; provided, that such utility may require that reasonable written application for service be made."

Inasmuch as the lines involved in the present controversy and covered by the specific contract in question are within incorporated territory, and inasmuch as in this particular case the Commission was not requested to authorize the signing of a contract for service, nor did it grant such authority, it cannot reasonably be urged that San Joaquin Corporation was justified in requiring this contract and the same should be cancelled.

Rule No. 15 in said Decision No. 2879, deals with the question of extension of service in incorporated territory, and is as follows:

"A water, gas, electric or telephone utility which operates under a general franchise authorizing the occupancy of all the streets of a municipality shall make, at its own expense, such street extensions as may be necessary to serve applicants; provided, that in any case in which the construction of an extension at the utility's sole cost will in its opinion work an undue hardship upon the utility or its existing consumers, the matter may be submitted to the Commission as provided by Section 36 of the Public Utilities Act, unless satisfactorily adjusted by an informal application to the Commission."

Inasmuch as the portion of this tract which is within

the incorporated limits of Fresno is adjacent to a thickly populated portion of the City, and the prospects for future development of this territory are good, I can not find that an undue hardship will be worked upon San Joaquin Corporation by extending its lines at its own expense to bona fide consumers within the portion of this tract which is situated within the corporate limits of the City.

IV

SELECTION OF THE PROPER SCHEDULE
IN CHANGING FROM THE OLD TO THE NEW SYSTEM OF RATES

The rates established by the Commission to become effective on San Joaquin Corporation's system on May 1st, 1916, were in many respects of an entirely different form from those which were formerly charged. Some difficulty has been experienced in a few instances as to the selection of the proper schedule to which consumers should have been transferred in establishing the new rates. This is especially true in regard to such consumers as were entitled to one of several optional schedules. Three such cases were brought to the Commission's attention at the hearings herein, and will be dealt with individually.

Mr. Ti Woo operates under lease a small ranch near Bakersfield, making use of a 5 horsepower motor to pump water for the irrigation of garden truck. Under the old rates, this consumer was on the $50.00 per-horsepower-per-year flat rate schedule, paying a monthly bill of $23.15, which corresponds to a de-

mand test of 5.56 horsepower.

Immediately after the Commission's decision became effective, San Joaquin Corporation printed its new rates, rules and regulations in pamphlet form and mailed a copy to each of its consumers, and advised that if they were entitled to any optional schedules the same would be granted upon the consumer's request to the San Joaquin Corporation. In the meantime, in order not to delay the rendition of the regular monthly statements, the Corporation billed each consumer upon the rate which it considered to be the nearest in form to that under which such consumer was formerly operating. Consumers on the old $50.00 per-horsepower-per-year flat rate were transferred to the 12 month seasonal rate under Schedule No. 4, at $42.50 per horsepower per year. Pending the consumer's application for a demand meter or the Corporation's installation of the same at its own option, all bills were based upon the rated installed capacity of the consumer's plant. This appears under the circumstances to have been a reasonable method of procedure on the part of the San Joaquin Corporation and even though certain consumers might not have received at once the benefit of the most advantageous rate provided in the new schedules, I do not believe that it is necessary to go back at this time and readjust these accounts, particularly where the consumer did not suffer an increase over the rates formerly in effect.

In Mr. Ti Woo's case the application of the new

schedule selected for him by San Joaquin Corporation resulted in a monthly payment of $18.19, as compared to his former monthly bill of $23.17. His contention is that the demand and energy form of rate provided in the new Schedule No. 6 would be still more advantageous under his operating conditions, and asks to have his account adjusted accordingly, back to May 1st, 1916.

It appears that this complainant does not own the ranch upon which the service is granted, but rents the same from Mr. E. J. Brandt, in whose name the power account is carried, and therefore the new schedules and notification regarding them were sent to Mr. Brandt who neglected to notify his tenant in regard to his rights as to the selection of rates, and made no request to the San Joaquin Corporation for any other schedule than that under which his service was automatically placed. I cannot find, therefore, that San Joaquin Corporation has acted in error in this matter, nor that any readjustment of this account is justified. It is suggested, however, that the Brandt contract be cancelled and that a new agreement be entered into with the tenant, as is frequently done in such cases, at a rate which will meet the actual conditions under which he requires electric service.

Mr. E. J. Martin, testifying on behalf of the firm of Martin and Snuffer, stated that this firm installed a cannery in Bakersfield on August 1st, 1916, and that for approximately one month prior to that date negotiations had been carried on with San Joaquin Corporation concerning a rate for electric

energy to operate a motor in this cannery. Mr. Martin, or his associates, were advised that Schedule No. 8 would apply and that the minimum monthly charge would be $1.00 per horsepower, regardless of the length of their season. Relying upon this advice, the consumer decided to install a 5 horsepower electric motor and proceeded to operate the plant for a period of three months. During this time the bills averaged from $6.00 to $7.00 per month. At the close of the season the cannery was shut down and the service was ordered discontinued. In the meantime the subject of proper minimum charges for short seasonal industrial business was taken up informally by San Joaquin Corporation with the Commission, and, in view of the fact that such business is more expensive to serve than that which is continuous throughout the year, the utility was advised that it might file a rule providing that industrial consumers, operating during seasons of less than 12 months under Schedules No. 8 and No. 9, should be required to guarantee a seasonal minimum revenue equivalent to the demand portion of Schedule No. 6B, being as follows:

Each month of a 3 months' Period	$3.25 per horsepower Connected
Each month of a 4 months' Period	$1.95 per horsepower Connected
Each month of a 5 months' Period	$1.70 per horsepower Connected
Each month of a 6 months' Period	$1.55 per horsepower Connected
Each month of a 7 months' Period	$1.40 per horsepower Connected
Each month of a 8 months' Period	$1.30 per horsepower Connected
Each month of a 9 months' Period	$1.20 per horsepower Connected
Each month of a10 months' Period	$1.10 per horsepower Connected
Each month of all months' Period	$1.05 per horsepower Connected

In pursuance of this plan, at the end of this complainant's canning season, San Joaquin Corporation rendered a bill for the difference between the energy actually consumed and the seasonal minimum of $9.75 per horsepower, the difference in this case amounting to approximately $27.00

The witness stated that had his firm been aware that such a minimum would be charged, it would not have installed electric power in this plant. Since this rule was made during the same period that this complainant was negotiating with San Joaquin Corporation, and since the consumer was not notified of the change until after the close of his season some three months later, I believe this complaint should be considered as a special case brought about by the difficulties of changing over the entire system of rates for this Corporation, and that in view of the facts, Martin and Snuffer should be charged only the $1.00 per horsepower per month minimum during their 1916 season in accordance with their original understanding. It will be necessary, however, to charge the regular rates on file for any further service.

Dr. C. W. Kellogg testified that he operates a 10 horsepower motor upon which the old demand test showed the load to be 8.44 horsepower, and that he was formerly on the daylight schedule at $36.00 per horsepower per year, and that the new schedule upon which he was placed by the San Joaquin Corporation resulted, during the first few months at least, in

an increase in his rates.

The evidence shows that the plan adopted by San Joaquin Corporation was to transfer all consumers formerly on the $36.00 daylight rate to Schedule No. 6-a, being the demand and energy form of rate established by the Commission. A study of Dr. Kellogg's load and consumption for the past 5 years, which is set forth in San Joaquin Corporation's Exhibit No. 4 herein, indicates that had this consumer been billed for the past 5 years in accordance with Schedule No. 6-a, he would have paid $1,405.09 as compared to $1,487.33, which he actually did pay for this service. Considering the past three years only, during which his actual operation of the plant has materially decreased, he would have paid $813.97, as compared to the $906.23 which he actually did pay. This appears to clearly indicate that the new schedules did not work any hardship in Dr. Kellogg's case.

It appears that Dr. Kellogg was advised by San Joaquin Corporation that the 12 months' seasonal rate would probably be best under his operating conditions. Making a study, however, of his consumption during the last three years, it is evident that 12 months' operation under Schedule No.6-a would have cost him $813.97, whereas had the service been taken for an 8 months season under Schedule No. 6-a, combined with the application of Rule No. 47 to the other four months of the year for domestic use, the same would have cost $766.72, indicating that the shorter season would be somewhat more advantageous than the schedule under which complainant is now operating. The difference would, of course, be materially reduced if a more continuous use of the plant were required during the off seasonal period.

V.

EFFECT OF THE USE OF MAXIMUM DEMAND METERS

1. Adjustment on the 94% Demand Factor Basis and the Effect of Abnormal Demands:

Rate Schedules No. 4 and No. 5 of the San Joaquin Corporation's rates, as fixed by this Commission, contain the following clause:

> "The above flat rates are based upon the connected load in motors or other utilization equipment which can be connected at any one time to the Company's supply system. Under normal conditions meters will not be installed by the Company on strictly flat rate business, but at the consumer's request demand indicating and watt hour meters will be supplied at a charge of $7.50 per year or fraction thereof, and the flat rate charges per horsepower of connected load will be re-adjusted on the basis of 94% demand factor."

Schedule No. 6 contains a similar clause, worded as follows:

> "The demand charges under this schedule are based on the connected load in motors or other utilization equipment which can be connected at any one time to the Company's supply system, and the meters regularly supplied are of the recording watt hour type. At the consumer's request, however, the Company

> will furnish and install demand indicating instruments at a rate of $3.00 per year or fraction thereof, and base the demand charge upon the measured monthly maximum demand, in which case the demand charges will be re-adjusted on the basis of 94% demand factor."

These are schedules of rates which apply only to agricultural service and under which most of the agricultural business of San Joaquin Corporation is now being served.

The language of this provision with reference to re-adjustment on the basis of 94 per cent demand factor has proved to be very difficult of interpretation by the average consumer unversed in the technical terms. Its intent and meaning may be somewhat clarified by a brief explanation.

A study of all of the agricultural pumping installations on San Joaquin Corporation's system in 1915, shows an average ratio of 94 per cent between the aggregate of their measured maximum demands, as determined by the utility's former method of testing, and the total rated capacity of all of the motors.

In order that San Joaquin Corporation might realize the revenue to which it was assumed to be entitled, certain rates per horsepower of connected load

were established. These rates are set forth in Schedules No. 4, No. 5 and No. 6. It was realized, however, that such rates would not be fair in every individual case because of the fact that the demands created by the operations of certain installations are considerably lower than the average. And vice versa when the demand created by the operation of any motor is in excess of its rated capacity, a rate based upon the latter would be unfair to the utility.

To take care of these various conditions, the Commission made the provision, as quoted above, for the payment upon the measured maximum demand basis in such cases rather than upon the rated capacity of the motor. It is obvious that if the same rates based upon the installed capacity were made to apply also to a measured maximum demand, which on the average was known to be only 94 per cent of the rated capacity, the result would be a reduction in rates not contemplated in the Commission's order. It was thought to be necessary, therefore, to provide that when the actual demands are to be used as a basis of rates, the charges then applicable should be increased by the ratio of 100 to 94, or in other words, "re-adjusted on the basis of 94% demand factor."

At the time these rates, herein referred to, were established, the only available information concerning consumers' demands, was the record of results

of maximum demand tests taken approximately once each year under the Company's former methods of testing, by which method the demands were presumably ascertained under running conditions after the plants had been in operation for a considerable period of time. Material objection to this method of testing was made by consumers at the time of the former proceedings, on the ground that taking such tests only once a year resulted in a hardship arising from the fact that the consumer's demand varied from month to month, and was often considerably less than the demand ascertained at the time of the annual test. The Commission, finding merit in these objections on the part of the consumers, endeavored to relieve the situation by providing for the installation of demand meters which would register the maximum demand created on any plant during each month, so that the consumer would not be penalized for an entire year on account of demands created during the most unfavorable season, the function of the demand meter being to register each month the maximum average load during any 15 minute interval.

In connection with the proceeding herein, many complaints have been received to the effect that the monthly measured maximum demand also results in a hardship to the consumer, due to the fact that any

abnormal load for a period of 15 minutes determines his charges for the entire month. In order to ascertain the magnitude of this difficulty, the Commission's Gas and Electric Department conducted tests on a number of plants in the McFarland District to determine the relation between the starting load created by a centrifugal pump and the normal load under running conditions. The results of these tests are shown in the Commission's Exhibit No. 2 herein. The average of six plants tested shows the load to have been 14.7 per cent higher during the first 15 minutes of operation than under running conditions several hours later. The maximum difference shown by any of these tests on a single plant was 19.2 per cent and the minimum 3.9 per cent.

San Joaquin Corporation had similar tests made on 24 plants on its system, the results of which are shown in its Exhibit No. 12 herein, and are summarized in the following table:

TABLE VI.

TESTS TO DETERMINE RELATION BETWEEN STARTING AND RUNNING LOADS ON PUMPING PLANTS.

Number of Plants Tested	District	Ratio of Load during First 15 Minutes to Load under Running Conditions: Average of Group	Maximum Plant in Group	Minimum Plant in Group
8	McFarland	112.5%	117.3%	103.4%
8	Corcoran	107.9	131 %	101 %
8	Madera	104.5%	113 %	97.4%
24	Above Three Districts	108.8%	136 %	97.4%

Up to the present time San Joaquin Corporation has actually installed comparatively few demand meters on pumping plants of its agricultural consumers, so that no conclusive data is yet obtainable which will indicate the actual relation of demands recorded by the demand meters under operating conditions to the demands as formerly determined by tests.

The inherent operating characteristics of the centrifugal pump are such that as the head against which it lifts the water is decreased, the amount of water lifted is increased, the net result being an increase in the load. When a pump of this type is

shut down for any material time, the water in the well raises and when the pump is started it will deliver an abnormally large volume of water until the water level again becomes normal. An abnormal load is thus created for a brief period immediately after the pump is started, and a portion at least of this excess load is recorded by a maximum demand meter.

Direct acting or plunger pumps used in connection with the operation of deep wells are not affected by changes in water level as are centrifugal pumps for the reason that the direct acting pump discharges the same amount of water regardless of the head against which it operates, the load increasing as the head increases. For the reason stated, the demand created by direct acting pumps under running conditions is usually greater than that shown during the starting period. It is, however, necessary at intervals to repack plunger pumps and thereby to create a somewhat abnormal load for short periods, which excess load will be reflected, to some extent, in the reading of the demand meter.

A study of the results of the tests above referred to clearly indicates that the demand factor of 94 per cent, derived from a consideration of the

average of the former tests, is not correct when applied to records of demand indicating meters set for a time interval of 15 minutes. Due to the difficulty in obtaining these meters, together with the reluctance on the part of consumers to request their installation, sufficient information is not as yet available which will accurately indicate the true average demand factor of agricultural pumping installations. The evidence at hand is sufficient, however, to indicate that the readjustment on the basis of a 94 per cent demand factor is not warranted in connection with the use of demand meters, and the same will be discontinued by the order herein.

San Joaquin Corporation has apparently discouraged the use of demand meters by its consumers on the ground that the abnormal conditions referred to above would result in many instances in higher loads recorded by such meters than the rated capacity of the plants, even where the former tests were considerably less than the connected load. The results of this policy are indicated by the fact that up to March 10th, 1917, only 83 requests have been received by San Joaquin Corporation from its agricultural consumers for the installation of demand meters.

A study of all agricultural consumers which were on the San Joaquin Corporation's system during the year 1915, shows the ratio of the tests made prior to May 1st, 1916, to the rated capacity of the motors to be as follows:

TABLE VII.

AGRICULTURAL LOAD CLASSIFIED AS TO DEMAND FACTORS

A

3.2% of horsepower connected, below 50% demand factor
7.8% of horsepower connected, below 60% demand factor
13.5% of horsepower connected, below 70% demand factor
28.6% of horsepower connected, below 80% demand factor
49.5% of horsepower connected, below 90% demand factor
72.2% of horsepower connected, below 100% demand factor.

B

18.3% of horsepower connected, between 100 and 110% demand factor
6.2% of horsepower connected, between 110 and 120% demand factor
2.4% of horsepower connected, between 120 and 130% demand factor
.9% of horsepower connected, between 130 and 172% demand factor

There can be but very few of the agricultural installations, represented by the 28.6 per cent

of the horsepower connected, where the previously ascertained demands were less than 80 per cent of the rated capacity, which would not benefit by the installation of a demand meter, and there is no question but that many of the 20.1 per cent where the demand factor was between 80 and 90 per cent, and some of the 22.7 per cent where the demand factor was between 90 and 100 per cent would also benefit by its use.

San Joaquin Corporation maintains kilowatt hour meters on the plants of all of its agricultural consumers, and it should, by every reasonable means, advise its consumers as to the method of determining, by revolution tests taken on these meters, the load on their plants at starting and also under normal conditions, so that these consumers can determine for themselves whether it would be better to apply for the installation of a demand meter or to continue to pay on the rated capacity of their motors.

In considering the advisability of making request for this demand meter, consumers should also bear in mind that a high demand affects only the rates to be paid for the one month during which the demand is created. An examination of the readings of the demand meters on the Mt. Whitney Power and Electric Company's system, referred to above, indicates a con-

siderable variation from month to month, and in the cases where the meters have been in service for five months, the average of the five readings shown was in many instances lower than the single annual test formerly taken on the same plant. These averages were taken into account in the above calculations.

2. Time Interval:

It has been suggested that further relief from the objectionable characteristics of demand meter readings might be obtained by increasing the time interval from 15 minutes to one hour. The 15 minute period tests taken on the San Joaquin Corporation's system indicate that such a change would, on the average, materially reduce the revenue from agricultural and possibly from other classes of consumers.

The fundamental objection which consumers urge in this regard is that they should not be required to pay for an entire month upon the basis of a high load which continues for possibly only one or two 15 minute periods during that month. A change to a one hour period would be equally susceptible to the objection that bills for an entire month should not

K

be based upon high loads which continue for only one or two periods of one hour each during the month. It is obvious that as long as the unit charge is proper, and the operation of demand meters is uniform as between consumers, this objection is of little real importance, the consumer's chief concern being the cost per acre foot of water rather than the form of rate. Owing to the fact that sufficient time has not as yet elapsed for a fair trial of the unit charges now in effect, I am of the opinion that no change should be made at the present time, either in the time interval or the rate per horsepower.

In many instances, the consumer will be able, with a little care, to control or entirely eliminate all abnormal demands so that no material increase in the monthly charges will result.

For instance, in starting a centrifugal pump, if a valve is installed either in the intake or in the discharge pipe whereby the quantity of water pumped can be reduced during the starting period, the valve being gradually opened as the head on the well is reduced, the load can be prevented from exceeding that under normal running conditions.

The principal cause of high demands in connection with plunger pumps is their use for filling domestic tanks, which are at a higher level than that

of the discharge for irrigating purposes. The time required to fill such tanks is, however, in general not greatly in excess of 15 minutes. This matter is receiving the careful consideration of the Commission but at the present time there appears no adequate relief for the difficulty. Tank pumping with an irrigation pump is an unsatisfactory load from the utility's point of view, and is not economical for the consumer. However, it is to be hoped that the difficulties of this situation can be met either by the installation of a small house pump by the consumer, or otherwise that the over-all cost of agricultural service may be reduced to as low a point as possible.

3. Determination of Demand when Meters are not Available:

San Joaquin Corporation has the option of installing demand meters at its own expense in cases where the actual load is materially in excess of the rated capacity. An analysis of the agricultural installations on this system during the year 1915, indicates that 27.8 per cent of the connected horsepower creates demands in excess of the rated capacity. Due to the difficulty of obtaining meters of the demand type under

present market conditions, San Joaquin Corporation has been unable to exercise its option in this regard. It is not reasonable that San Joaquin Corporation should be deprived of revenue to which it is entitled in these cases, on account of impossibility of securing meters, due to market conditions over which it has no control.

If San Joaquin Corporation makes tests under normal running conditions at the present time, and finds in any case that the demand factor is in excess of 100 per cent, and if in each such case it files with this Commission notice of its intention to install a demand meter as soon as the same is available, and at the same time serves a similar notice upon the consumer advising him that until such meter is installed he has the right to demand a new test not oftener than once in three months without expense to himself, San Joaquin Corporation should be permitted, beginning with the date upon which such notice is filed, to charge such consumer on the basis of the last demand test on record until the meter is actually installed, or until a new test is taken. The present rule, which has been established informally, should continue, to the effect that in any case where a consumer whose demand factor is lower than 100 per cent has requested and paid the fee for a demand meter, and where such a meter is not available, San Joaquin

Corporation shall charge consumer for electric service on the last demand test on record, provided that either the consumer or the utility may require a new test at any time. To this rule should be added the provision that consumers of this class requiring tests oftener than once in two months shall bear the actual expense of the same.

4. Demand Charge for Pit Lights:

Complaint has been made by a number of consumers against the practice of the San Joaquin Corporation in adding .16 horsepower to the rated capacity of the consumer's motor in determining his connected load for billing purposes. This is to cover the two lights which are ordinarily used in the pump house and pit. The flat rates or demand charges established by the Commission were:

> "Based upon the connected load in motors or other utilization equipment which can be connected at any one time to the Company's supply system."

There can be no question but what electric lamps must be considered as utilization equipment, and where a demand meter is installed these lamps should,

of course, be so connected that their load, as well as that of the motor would be recorded by such meter. Inasmuch as incandescent lamps in the pump house can be and are operated at the same time the motor is operating, it is proper that the amount of power they require should be added to the capacity of the motor. The .16 of a horsepower which San Joaquin Corporation has assumed to be average, and for which they charge each consumer, is practically equivalent to two 60 watt lamps, or the equivalent of two of the now obsolete type of 16 candlepower carbon filament lamps. In most instances two 25 watt, or even 20 watt, tungsten lamps would fully serve the consumer's purpose, and where these are in use ~~the Corporation~~ should not Corporation/~~is~~ charge for more than the actual wattage of the lamps in use.

VI.

SEASONAL SERVICE

1. Determination of Date upon which Season shall Start.

One of the greatest advantages which the agricultural consumer has realized through the Commission's revision of San Joaquin Corporation's rates, is the flexible system established which permits the consumer to make use of service for the season during which it is actually required. Many contracts have been signed for seasonal periods of less than 12 months per year.

The Commission has heretofore indicated that San Joaquin Corporation is entitled to require contracts for a term of 3 years in the first instance in connection with agricultural service and some other classes of service, and

in considering the justification for extending its service to new consumers, the length of the season for which service is desired is probably the most important factor. It is entirely reasonable, therefore, that the prospective consumer should be required to contract for a definite length of season during each year of the life of such contract. It is clearly unreasonable, however, that the consumer should be required to forecast definitely the date when he desires such season to start. San Joaquin Corporation's contracts for agricultural consumers should contain the provision that the service will be reconnected on a certain definite date each year, unless the consumer gives ten days written notice that it is desired to begin the season on some different date from that referred to in the contract.

2. Additional Service Beyond the Season Contracted For.

Rule No. 4 of the San Joaquin Corporation's rules and regulations, provides that consumers under existing contracts may make changes in the size of their motor installations by either increasing or decreasing the same, providing such change is satisfactory to the utility, and in its opinion will not work an undue hardship upon it or its then existing consumers. This rule further provides that any consumer under an existing agricultural contract for a less period than 12 months in any year, may be furnished with additional service either before or after the season shown in the contract

at the same rate which he would be required to pay had such additional period been included in the contract season, plus $1.00 per horsepower per month in the case of flat rate consumers, or plus 75 cents per horsepower per month in the case of consumers taking service under the demand and energy rates.

Inasmuch as the rates established for short seasons are higher per horsepower per month than those for longer seasons, it is to be presumed that consumers who contract for a shorter season have at least taken care of the greater part of the fixed costs when they pay the regular rates for such service. I do not believe there is any real necessity or justification for penalizing the consumer who requires service for an additional period beyond that specified in his contract. It would be to the advantage of the San Joaquin Corporation to encourage additional use of its service by such consumers, and this rule should, therefore, be revised so that additional service if continuous may be taken at the same rates as though the extra period had been included in the original contract. When this rule is applied to service required during periods not adjacent to the contract season, San Joaquin Corporation may require its consumers to pay the cost of disconnecting and reconnecting the service for such additional period.

VII.

VOLTAGE CONDITIONS IN EAST BAKERSFIELD

In regard to the quality of San Joaquin Cor-

poration's service, the opinion in Decision No. 3241, referred to above, contained in part the following language:

> "The only other serious complaint against the service supplied by the San Joaquin Corporation was directed against the differences between the voltage maintained by the Corporation's supply systems in East Bakersfield and in Bakersfield. This condition should be rectified at once. The rates herein established contemplate that a uniform standard voltage, phase and frequency will be maintained for each class of service in each community, larger unit or over the entire system."

The evidence herein develops the fact that 40 per cent only of the changes required in Bakersfield to comply with this portion of the Commission's order, effective May 1, 1916, had been completed on March 5, 1917.

In the absence of any adequate showing on the part of the San Joaquin Corporation that it has been impossible for it to proceed to carry out the Commission's order to rectify this condition "at once", I cannot assume that any such delay was justified, and San Joaquin Corporation will be expected to carry this work to completion without further delay.

VIII

MODIFICATION OF OTHER SCHEDULES AND RULES

1. Off Pumping Season Service for Agricultural Consumers.

The Tulare County Electric Users Association, which represents a number of San Joaquin Corpora-

tion's consumers as well as many of those taking service from Mt. Whitney Power and Electric Company, has filed a brief herein, in which the following argument is urged:

> "As regards the effective rates for agricultural service, we recognize and duly acknowledge that the present rates are in some respects more advantageous for the consumer than the rates in force prior to May 1, 1916. The greatest saving made possible to the consumer is due to the establishment of seasonal rates. A consumer is thus enabled to buy power for fractional parts of a year, instead of being compelled to take service for the entire year as under the former rates. In connection with this matter of seasonal service, we wish to direct attention to the numerous suggestions contained in the letters submitted by us to the Commission, that some more favorable rate than is provided for under the existing rate schedules be established for the off season period. Many ranchers desire to use their pumping installations after the close of the seasonal irrigating period, for pumping water for domestic purposes and stock water, or irrigating small garden patches. The combinations permissible in connection with the seasonal rates, under the existing rules, are not economical for the cost of service during the off season period is too high. In some instances ranchers have been forced to install small plants for domestic purposes, to get service at a reasonable cost during this off season period, thus entailing an additional investment."

San Joaquin Corporation, in its answer to this argument, urges that its rule No. 47, which has been on file with the Commission since July 5, 1916, amply takes care of this situation. This rule is as follows:

> "Should any consumer, under an existing executed agricultural contract for a less period than twelve months in any year of the term thereof, desire to be furnished with additional ser-

"vice for domestic purposes for a continuous period immediately preceding or immediately following such contract period, then upon receipt by the Company from the consumer of a written application to the Company therefor, on a form furnished by the Company for that purpose, said application being made to the Company at one of its local offices, at least ten days prior to the date of the beginning of such additional service desired preceding the contract period in such year, or upon receipt by the Company from the Consumer of a written application to the Company therefor, on a form furnished by the Company for that purpose, said application being made to the Company at one of its local offices at least ten days prior to the end of such contract period for said year, such application being made for such additional service desired following the date of the end of such contract period, for said year, the Company shall furnish to the Consumer such additional service so desired at the following rates, to-wit:

"In accordance with Schedule No. 1, provided, however, that the minimum monthly charge shall be one dollar per horsepower of connected load on motor installations up to and including three horsepower; three dollars and fifty cents on installations in excess of three horsepower but less than seven and one-half horsepower; fifty cents per horsepower of connected load on motor installations of seven and one-half horsepower and over."

Schedule No. 1 referred to here is the regular rate designed for residence lighting, being 8 cents per kilowatt hour for the first 20 kilowatt hours per month, and 4 cents per kilowatt hour for all energy in excess of 20 kilowatt hours per month.

Inasmuch as the rates established for the shorter season were designed to cover the annual fixed costs, even though no energy might be consumed during the off pumping season, it is clearly to the advantage

of the utility to encourage such use by as favorable a rate as possible. A further reason for making such a rate is the fact that the use of the service will occur mainly off ~~of~~ the seasonal peak.

I suggest the following form of rule to apply to service of this character:

> Where a contract is made for agricultural service under Schedule No. 4 or Schedule No. 6-a for a seasonal period of not less than three months, at the expiration of said seasonal service, or any extension thereof, the consumer, under such contract, will be supplied with current for all purposes for the remaining months of the year as follows:
>
> First 20 kilowatt hours per month per meter: 8¢ per kilowatt hour,
> Next 50 kilowatt hours per month per meter: 4¢ per kilowatt hour,
> All Over 70 kilowatt hours per month per meter: 2¢ per kilowatt hour.
>
> Minimum Monthly Charge 50¢ per horsepower connected
> Minimum Monthly Bill under this Rule shall be $1.00

2. Rates for Agricultural Consumers whose Load Factor is Low:

Our attention has been called to a class of agricultural consumers whom it is not possible for San Joaquin Corporation to serve under any of its existing schedules because of the very low load factor at which these plants operate. I refer to farmers who receive gravity water from ditch systems, and who require a pumping plant at times to supplement this supply and also to owners of deciduous fruit orchards which require irrigation but infrequently. Not being able to economically operate under the present rates designed for use under high load factor conditions, such consumers are forced to resort to the installation of gas engines or other alternative motive power, with a resultant loss of gross revenue to the San Joaquin Corporation and excessive cost to the would be consumer.

Undoubtedly the addition of this class of business would increase the saturation of load on San Joaquin Corporation rural lines, many of which are at present not fully loaded, without a corresponding increase in distribution line investment.

Schedule No. 8 is a rate which was designed for application to industrial business. The principal objection to its application to agricultural business in general is that the distribution line investment is larger per horsepower for this class of service than is usual with industrial business. This argument does not hold in connection with the addition of business to existing lines, and, of course, in considering the justification for line extensions, account must be taken of the probable

revenue under the rate selected before such extension is made.

I suggest that Schedule No. 8 be re-worded to read as follows:

Schedule No. 8

General Power Rate
Metered Service

Applicable to all agricultural and general power installations, of not more than fifty (50) horsepower installed capacity, receiving energy at 110 or 220 volts at the consumer's option, single phase, two phase or three phase service at option of Company.

4¢ per kilowatt hour for the first 200 kilowatt hours consumed during any month.

2¢ per kilowatt hour for all energy used during any month in excess of 200 kilowatt hours.

Minimum Charge

For Continuous Industrial Service, supplied from secondary distribution systems, $1.00 per month per horsepower connected.

For Seasonal Industrial Service:

Each month of a	3 months'	period	$3.25 per horsepower connected
Each month of a	4 months'	period	2.50 per horsepower connected
Each month of a	5 months'	period	2.05 per horsepower connected
Each month of a	6 months'	period	1.75 per horsepower connected
Each month of a	7 months'	period	1.55 per horsepower connected
Each month of a	8 months'	period	1.40 per horsepower connected
Each month of a	9 months'	period	1.25 per horsepower connected
Each month of a	10 months'	period	1.15 per horsepower connected
Each month of a	11 months'	period	1.05 per horsepower connected
Each month of a	12 months'	period	1.00 per horsepower connected.

For all service supplied from rural lines, $12.00 per year or fraction thereof per horsepower connected.

Minimum Bill

Minimum Monthly Bill where service is supplied from secondary distribution systems, $1.00 per month per meter.

Minimum Seasonal Bill: the equivalent of the minimum charge for 3 months service for one horsepower.

Minimum Bill for service supplied from rural lines $30.00 per meter.

3. Seasonal Industrial Minimum:

Some time after the new rates were established it was found necessary to establish minimum charges for seasonal industrial business. Such minimum charges, established after informal conference between representatives of the utility and the Commission were made the equivalent of the demand charges fixed for agricultural business under Schedule No.6-b, being as follows:

Each month of a	3 months'	period	$3.25 per horsepower connected,
Each month of a	4 months'	period	1.95 per horsepower connected,
Each month of a	5 months'	period	1.70 per horsepower connected,
Each month of a	6 months'	period	1.55 per horsepower connected,
Each month of a	7 months'	period	1.40 per horsepower connected,
Each month of a	8 months'	period	1.30 per horsepower connected,
Each month of a	9 months'	period	1.20 per horsepower connected,
Each month of a	10 months'	period	1.10 per horsepower connected,
Each month of a	11 months'	period	1.05 per horsepower connected,

This schedule of minimums was appended to Schedule No. 6-c, No.8 and No. 9-a.

Certain inconsistencies have developed in the application of this schedule of graduations as minimum charges. Where it is so applied it should be revised to conform to the

seasonal minimums as set forth above, as a part of revised Schedule No. 8

IX

SERVICE INTERRUPTIONS

Some complaint was made to the effect that service on San Joaquin Corporation's rural electric distribution lines is frequently interrupted, often for only a few seconds at a time, but long enough so that connected centrifugal pumps lose their priming or the interruption or drop in voltage results in the tripping of the low voltage release. It was pointed out by representatives of the San Joaquin Corporation that many of the agricultural plants are operating with a vacuum, which is very close to the maximum, so that even a very slight variation in the speed of the pump will often cause it to lose its priming. It is claimed that such interruptions to the flow of the water cannot be properly charged against the continuity of service delivered by the Corporation.

The Commission has under preparation at the present time a general order establishing standards of quality and condition of service to be delivered by electric utilities in this State, and this subject may very properly be left for consideration in connection with that general order.

I submit the following form of order:

O R D E R

Public hearings having been held in the above entitled proceeding, and the same having been submitted and being now ready for decision, the Railroad Commission now makes the following findings of fact:

(1) The Railroad Commission finds that the rates, rules, regulations, contracts and practices of San Joaquin Light and Power Corporation are unjust and unreasonable insofar as they differ from the rates, rules, regulations, contracts and practices found to be just and reasonable in the opinion which precedes this order.

(2) The Railroad Commission hereby finds that the rates, rules, regulations, contracts, practices and acts to be performed by San Joaquin Light and Power Corporation as set forth in the opinion which precedes this order are just and reasonable rates, rules, regulations, contracts, practices and acts to established, charged, collected, enforced and performed by San Jaquin Light and Power Corporation.

Basing its order on the foregoing findings of fact, and on each statement of fact contained in the opinion which precedes this order,

IT IS HEREBY ORDERED that San Joaquin Light and Power Corporation be, and the same is hereby ordered and directed to establish and file with the Railroad Commission on or before May 20, 1917, and thereafter to observe the rates, rules, regulations, contracts and practices set forth in the opinion which precedes this order, and that San Joaquin Light and Power Corporation be and the same is hereby ordered and directed to perform each act which the opinion which precedes this order states should be performed by it.

The foregoing Opinion and Order are hereby approved and ordered filed as the opinion and order of the Railroad Commission of the State of California.

Dated at San Francisco, California, this 2d day of May, 1917.

Max Thelen

A. Lovelace

Alex Gordon

Edwin O. Edgerton

Commissioners.