

ORIGINAL

Decision No. 49024

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of CALIFORNIA ELECTRIC ) Application No. 32188  
POWER COMPANY for increase of rates.) (Amended)

FIFTH SUPPLEMENTAL ORDER

By Decision No. 46397 dated November 6, 1951, the Commission ordered applicant in this proceeding to prepare two cost-of-service studies, one as to classes of service and the other as to areas. Subsequently, the Commission issued four orders extending the time within which the results of such studies were to be filed. The last such order, dated April 21, 1953, required that applicant shall file the results of such studies with the parties and the Commission not later than November 1, 1953.

As recited in the fourth order extending time, applicant filed, on January 21, 1952, an "Outline of Basis of Cost of Service Allocation Studies". As provided in Decision No. 46397, protests or criticisms with respect to applicant's proposals were filed February 18, 1952, by West End Chemical Company, California Manufacturers Association, Southwestern Portland Cement Company, Riverside Cement Company, and the United States of America, Department of the Navy.

After consideration of the four prospective bases presented in applicant's outline, and the comments submitted by the parties, a detailed schedule of procedure to be followed by applicant in making said cost-of-service studies has been prepared and is attached hereto as Appendices A and B. The methods and procedures set forth in said appendices have been developed with due regard to conditions inherent in applicant's system during the test period

of the calendar year 1951 under assumed average water conditions and a 6 per cent rate of return on a depreciated rate base. These conditions were stated in the Commission's opinion in Decision No. 46397. The methods and procedures set forth in Appendices A and B are not necessarily appropriate for other cost-of-service allocation studies on applicant's or other systems.

Therefore,

IT IS HEREBY ORDERED that applicant shall prepare the two cost-of-service allocation studies required by Part 4 of Decision No. 46397 in accordance with the procedures set forth in Appendix A and Appendix B attached hereto, and shall file the results of said studies with the parties and the Commission not later than November 1, 1953.

The effective date of this order shall be the date hereof.

Dated at San Francisco, California, this 1st day of September, 1953.

R. E. Johnson  
 President  
James J. Calahan  
Lawrence Patten  
John L. Mitchell

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 Commissioners

OUTLINE OF METHODS TO BE FOLLOWED BY  
CALIFORNIA ELECTRIC POWER COMPANY  
IN  
COST OF SERVICE ALLOCATION STUDIES  
OF OPERATIONS IN ITS CALIFORNIA ELECTRIC DIVISION  
PURSUANT TO DECISION NO. 46397

This outline will establish the basis of allocation and methods to be followed by California Electric Power Company in preparation of the two cost-of-service studies required by Part 4 of the Commission's Order in Decision No. 46397, dated November 6, 1951. In accordance with said order and extensions of time later granted, California Electric submitted to the Commission, and served on all parties to the proceeding in Application No. 32188, outlines of four possible bases for such studies. In due course, protests and suggestions were received from five of the interested parties.

After study of the suggestions and comments presented by all of the parties, the basis set forth in this outline has been formulated to be followed in the preparation of those two cost studies. It is recognized that the allocation procedures set forth in this outline embody many approximations. In particular, the assignments to the categories of Street Lighting, Transmission Delivery and International Delivery, while sufficiently precise for the purpose of cost allocations for the other classes on the main system, provide only a very rough indication of proper allocated costs for those minor categories. Much more detailed study of the conditions pertaining to service for those three categories would be necessary if the range of approximation in those cases were to be reduced.

The outline is arranged under four major subdivisions, as follows:

- A - Plan of Outline and Procedure
- B - Basis of Total Cost
- C - Capital and Expense Allocations
- D - Comparisons of Costs and Revenues

A - PLAN OF OUTLINE AND PROCEDURE

Classes of Service

Costs are to be developed for the following classes of service:

1. Residential
2. General Service, Non-demand
3. General Service, Demand Metered
4. Agricultural
5. Other Public Authorities
6. Resale
7. Street Lighting
8. Transmission Delivery
9. International Delivery

## A - PLAN OF OUTLINE AND PROCEDURE

Classes of Service (cont'd)

In this analysis transmission delivery will be those deliveries from the California Division at 55 kv or above to Mineral County Power System, U. S. Navy Hawthorne Ammunition Depot, and to the company's Nevada Division.

The international delivery includes only those deliveries to Industrial Electrica Mexicana at Calexico and Andrade.

The transmission delivery and international delivery are to be excluded from the classes in which they otherwise would be carried.

Areas

Costs are to be developed for four areas. The areas and the operating districts to be included therein are as follows:

<u>Northern Area</u>	<u>Central Area</u>	<u>Southern Area</u>	<u>International Area</u>
Mono	San Bernardino	Palm Springs	International Delivery
Inyo	Riverside	Twentynine Palms	
Randsburg	Corona		
Victorville	Perris-Elsinore		
Barstow	Hemet-San Jacinto		
Blythe			

The demands, energy, cost allocations and other factors pertaining to the Transmission Delivery are to be included in the Northern Area.

Allocation Procedures

In general, the allocation procedures are parallel for capital and expenses. The first step is the segregation and allocation of total capital or expenses into the categories of Production and Transmission, Distribution, Street Lighting, International Delivery, and Transmission Delivery. This allocation is identified by Roman numeral code.

After assignment to such categories, the expenses are then allocated to the functions of Demand, Commodity and Customer. In this allocation to functions, except when specific considerations warrant modification, the allocation to Commodity Component is made in the same percentage as system load factor. For this purpose system load factor is:

$$\frac{\text{Kilowatt-hours net generation plus purchased input for year}}{8760 \times \text{peak simultaneous demand in kilowatts}} \times 100\%$$

The peak simultaneous demand is the sum of the average demands for one hour at net generation and at points of interconnection with other systems during that hour of the year when such sum is the greatest. Arabic numerals are used in coding the allocation to functions.

## A - PLAN OF OUTLINE AND PROCEDURE

## Allocation Procedures (cont'd)

For the major part, the quantities thus assigned to the Demand Component are allocated to classes or to areas in the ratios of noncoincident excess demands at distribution input. The excess demand of a class is the difference between the maximum noncoincident demand and the average demand for the year of that class at distribution input. Commodity components are allocated on the basis of kilowatt-hours at distribution input. When it enters into a calculation, Transmission Delivery at the metering points is considered to be input to distribution. Capital letters are used in coding the allocation to classes and lower case letters in coding the allocation to areas.

The method of calculating class or area kilowatt-hour requirements and noncoincident excess demands, at distribution input, is outlined in Appendix B.

Abbreviations Used in Allocation Tables

The following abbreviations have been used in the allocation tables:

Col	Column	GP	General Plant
Comm	Commodity	IND	International Delivery
Cust	Customer	Mtrs	Meters
CWIP	Construction Work in Progress	OL	Overhead Lines
Dem	Demand	R & R	Removing and Resetting
Dir	Direct	St.Lt.	Street Light
Excl	Excluding	TD	Transmission Delivery

## B - BASIS OF TOTAL COST

The basic data to be used in these studies will be the revenue, expense and rate base figures for the estimated 1951 average year which were adopted in Decision No. 46397, including a return of 6% on a depreciated rate base. Where a further breakdown of the data is required, a proration may be made upon the basis of the actual figures for the year 1951. The decision shows the following adopted results on the 5% Modified Sinking Fund Method for the test year 1951 under average water conditions:

## APPENDIX A - PAGE 4 of 24

## B - BASIS OF TOTAL COST

	<u>At Rates Effective Before Nov. 30, 1951</u>	<u>At Authorized Rates</u>
Operating Revenues	\$ 10,928,507	\$ 11,623,507
Production Expenses	3,920,000	3,920,000
Other Operating Expenses	2,124,000	2,124,000
Depreciation	875,000	875,000
Taxes	<u>2,041,137</u>	<u>2,418,000</u>
Total Operating Expense	\$ 8,960,137	\$ 9,337,000
Net Revenue	\$ 1,968,370	\$ 2,286,507
Rate Base	\$ 38,042,000	\$ 38,042,000
Rate of Return	5.17%	6.01%

Deliveries and Revenues

The breakdown to classes of the adopted deliveries and revenues at the rates effective prior to November 30, 1951, is as follows:

<u>Class No.</u>	<u>Class Description</u>	<u>Deliveries M-kwhr</u>	<u>Revenues</u>
1	Residential	80,084	\$ 2,702,000
2 and 3	General Service - Demand and Nondemand	461,734	5,620,107
4	Agricultural	105,000	1,350,000
5	Other Public Authorities	10,388	112,200
6	Resale (Excl. TD & IND)	11,158	168,400
7	Street Lighting	1,141	39,900
8	Transmission Delivery	33,678	331,900
9	International Delivery	<u>53,200</u>	<u>547,000</u>
	Total Sales	756,383	\$10,871,507
	Other Electric Revenue		<u>57,000</u>
	Total Operating Revenue	756,383	\$10,928,507

## APPENDIX A - Page 5 of 24

## B - BASIS OF TOTAL COST

Deductions from Operating Revenues

The following breakdown of adopted expenses may be developed from Decision No. 46397 and the exhibits referred to therein:

Production Expenses		
Purchased Power for International Delivery	\$ 367,500	
Other Production Expenses	<u>3,552,500</u>	
Total Production Expenses		\$ 3,920,000
Transmission, Distribution, Customers		
Accounting and Collecting, and Sales Promotion		1,470,100
Administrative and General Expenses		653,900
Depreciation Annuity		552,100
Depreciation Interest on Reserve		322,900
Taxes other than on Income		1,060,000
Income Taxes (at authorized rates)		<u>1,358,000</u>
Total Deductions from Operating Revenue		<u>9,337,000</u>
Loss: Credit of Other Electric Revenues		<u>(57,000)</u>
Net Costs Excluding Return on Rate Base		9,280,000

(Red Figure)

Rate Base

The rate base shown in Decision No. 46397 for the test year 1951 on a 5% Modified Sinking Fund Basis is \$38,042,000. This figure is shown in Table E of Exhibit 19 and further details of its development are given in Chapter XIV and XV of Exhibit 18.

## C - CAPITAL AND EXPENSE ALLOCATIONS

The procedures to be followed in allocation of capital are given in Table 1, and the several codes are described in the pages following the table. The total depreciated rate base developed in Table 1, line 68, column 2 will be \$38,042,000.

The procedures to be followed in allocation of expenses are given in Table 2, and the codes for expense allocations are described in the pages which follow that table. The total costs developed in Table 2, line 89, column 2 will be \$11,566,507.

TABLE 1, Sheet 1 of 3  
CODES FOR ALLOCATION OF CAPITAL

A-32188

Line No.	Capital	Functional Code to Class of Service Code to Area													
		Category	Total Capital	Code to Function	Dem	Comm	Cust	Dem	Comm	Cust	Dem	Comm	Cust	Total	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
<u>Production and Transmission</u>															
1	Production	I	x	1	x	x	-	A	B	-	a	b	-	-	
2	Transmission (Excl. TD)	I	x	1	x	x	-	A	B	-	a	b	-	-	
3	Subtotal Prod. & Trans. Dir.		x		x	x	-								
4	<u>Other Items</u>														
5	Intangible Plant	II	x	1	x	x	-	A	B	-	a	b	-	-	
6	General Plant	III	x	1	x	x	-	A	B	-	a	b	-	-	
7	Dep'n Reserve--Auto & GP	III	(x)	1	(x)	(x)	-	A	B	-	a	b	-	-	
8	Dep'n Reserve--Capital on Line 3	Dir	(x)	1	(x)	(x)	-	A	B	-	a	b	-	-	
9	Contrib. & Advances for Const.	IV	(x)	1	(x)	(x)	-	A	B	-	a	b	-	-	
10	Plant Acquisition Adjustment	Dir	(x)	1	(x)	(x)	-	A	B	-	a	b	-	-	
11	Materials and Supplies	V	x	1	x	x	-	A	B	-	a	b	-	-	
12	Working Cash Capital	VI	x	1	x	x	-	A	B	-	a	b	-	-	
13	Nonoperative Property	Dir	(x)	1	(x)	(x)	-	A	B	-	a	b	-	-	
14	Subtotal Other Items		x		x	x	-								
15	Total Prod. & Trans. Net Cap.		x		x	x	-								
<u>Distribution</u>															
16	Land, Sta. Equip. & Struct. (Excl. IND)	Dir	x	2	x	x	x	C	D	E				c	
17	Overhead Lines (Excl. St. Lt. & IND)	VII	x	3	x	x	x	C	D	F				c	
18	Underground Lines	Dir	x	4	x	x	x	C	D	G				c	
19	Line Transformers	Dir	x	5	x	x	x	C	D	H				c	
20	Services	Dir	x	Dir	-	-	x	-	-	I				c	
21	Meters (Excl. St. Lt., TD & IND)	Dir	x	Dir	-	-	x	-	-	I				c	
22	Installations on Cust. Premises	Dir	x	Dir	-	-	x	-	-	J				c	
23	Subtotal Dist. Capital 12-31-50		x		x	x	x								
24	Oper. CWP 12-31-50 & Weighted Avg. A's & B's 1951	IV	x	6	x	x	x	C	D	K				d	
25	Subtotal Dist. Direct Capital		x		x	x	x								

APPENDIX A - Page 6 of 24



TABLE 1 - Sheet 2 of 3  
CODES FOR ALLOCATION OF CAPITAL

Line No.	Capital	Functional Code to Class			Code to Component of Service			Code to Area			Total			
		Category	Capital	Function	Dem	Comm	Cust	Dem	Comm	Cust		Dem	Comm	Cust
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Distribution (Cont'd)</u>														
26	Other Items													
27	Intangible Plant	II	x	6	x	x	x	C	D	K	X			e d d r o s
28	General Plant	III	(x)	6	(x)	(x)	(x)	C	D	K				
29	Dep'n Reserve--Auto & GP	III	(x)	6	(x)	(x)	(x)	C	D	K				
30	Dep'n Res.--Capital on Line 25	Dir	(x)	6	(x)	(x)	(x)	C	D	K				
31	Contrib. & Advances for Const.	IV	(x)	6	(x)	(x)	(x)	C	D	K				
32	Materials and Supplies	V	x	6	x	x	x	C	D	K				
33	Working Cash Capital	VI	x	7	x	x	x	C	D	L				
34	Subtotal Other Items		x		x	x	x							
35	Total Distrib. Net Capital		x		x	x	x							
<u>Street Lighting</u>														
36	Street Lighting & Signal Systems	I	x	8	x	x	x	X			e h o u s i n g			
37	Dist'n Poles & Fixtures	VII	x	8	x	x	x							
38	Meters	I	x	Dir	-	-	x							
39	Subtotal St. Lt. Direct		x		x	x	x							
40	Intangible Plant	II	x	9	x	x	x							
41	General Plant	III	(x)	9	(x)	(x)	(x)							
42	Dep'n Reserve--Auto & GP	III	(x)	9	(x)	(x)	(x)							
43	Dep'n Res.--Capital on Line 39	Dir	(x)	9	(x)	(x)	(x)							
44	Materials and Supplies	V	x	9	x	x	x							
45	Working Cash Capital	VI	x	10	x	x	x							
46	Total--St. Lt. Net Capital		x		x	x	x							

TABLE 1 - Sheet 3 of 3  
CODES FOR ALLOCATION OF CAPITAL

A-52188

Line No.	Capital	Functional Code to Class											Total	
		Code to Category	Total Capital	Code to Function	Dem	Comm	Cust	Dem	Comm	Cust	Dem	Comm		Cust
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Transmission Delivery</u>														
47	Transmission	I	x	1	x	x	-							
48	Meters	I	x	Dir	-	-	x							
49	Subtotal TD Direct		x		x	x	x							
50	Intangible Plant	II	x	9	x	x	x							
51	General Plant	III	x	9	x	x	x							
52	Dep'n Reserve--Auto & GP	III	(x)	9	(x)	(x)	(x)							
53	Dep'n Reserve--Capital on Ln. 49	Dir	(x)	9	(x)	(x)	(x)							
54	Materials and Supplies	V	x	9	x	x	x							
55	Working Cash Capital	VI	x	11	x	x	x							
56	Total TD Net Capital		x		x	x	x							
<u>International Delivery</u>														
57	Land, Sta, Equip. & Struct.	I	x	12	x	x	x							
58	Overhead Lines	I	x	8	x	x	x							
59	Meters	I	x	Dir	-	-	x							
60	Subtotal IND Direct		x		x	x	x							
61	Intangible Plant	II	x	9	x	x	x							
62	General Plant	III	x	9	x	x	x							
63	Dep'n Reserve--Auto & GP	III	(x)	9	(x)	(x)	(x)							
64	Dep'n Res.--Capital on Line 60	Dir	(x)	9	(x)	(x)	(x)							
65	Materials and Supplies	V	x	9	x	x	x							
66	Working Cash Capital	VI	x	13	x	x	x							
67	Total IND Net Capital		x		x	x	x							
68	TOTAL DEPRECIATED RATE BASE		x		x	x	x							

APPENDIX A - Page 8 of 24

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocations of Capital to Categories

<u>Code</u>	<u>Allocation Basis</u>
I	Plant in service beginning of year direct, plus operative construction work in progress beginning of year and weighted average net additions during the year by special analysis.
II	Assign Franchises and Consents to Distribution. Allocate Organization to all categories in proportion to direct capital shown on lines 3, 25, 39, 49 and 60.
III	Allocate to all categories in proportion to direct capital shown on lines 3, 25, 39, 49 and 60.
IV	By special analysis.
V	Allocate to all categories in proportion to gross additions and betterments for five-year period 1947-1951.
VI	Allocate to all categories in proportion to direct expenses shown in Table 2, Lines 3, 27, 37, 58, 70 and 81, less one-half of Purchased Power Expense.
VII	Portion assigned to Street Lighting from average of beginning and end of year Distribution Poles and Fixtures account, Acct. No. 354, by formula:  $\frac{300 \times \text{number of non-metered street lights}}{5280 \times 2.5 \times \text{number of circuit miles of distribution lines}} \text{ times}$ average distribution poles and fixtures capital

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Capital to Functions

<u>Code</u>	<u>Allocation Basis</u>
1	Load Factor Basis - Main and Blythe Systems Combined: Commodity component equals dollar amount multiplied by 1951 system load factor. Remainder is assigned to Demand.
2	Land, Station Equipment, and Structures <ul style="list-style-type: none"> <li>A - To Customer               <ul style="list-style-type: none"> <li>1 - Plot dollars in Account 352 (Ordinates) against kva for substations of various sizes</li> <li>2 - Extrapolate curve (straight line) to zero x - intercept.</li> <li>3 - Multiply figure obtained in 2 by number of substations and divide by total amount in Account 352. Use percentage figure thus obtained to assign total capital in this group to customer component.</li> </ul> </li> <li>B - The remainder of this group is to be assigned to Demand and Commodity on the load factor basis.</li> </ul>
3	Overhead Lines <ul style="list-style-type: none"> <li>A - To Customer               <ul style="list-style-type: none"> <li>1 - Segregate into miles of line incorporated and unincorporated.</li> <li>2 - Let <math>x =</math> cost per mile inc. <math>ax =</math> cost per mile uninc. (a to be obtained by analysis of sample work orders.)</li> <li>3 - (Miles Line Inc.) <math>(x) +</math> (Miles Line Uninc.) <math>(ax) =</math> Capital in O.H. Lines. Solve for x.</li> <li>4 - <math>(x)</math> (Miles Line Inc.) <math>(1 -</math> Cust. Comp. obtained in 2A3) <math>= b =</math> Inc. area non-cust. comp. <math>(b) +</math> Number of Cust. Inc. <math>= c =</math> dollars per inc. cust. non-cust. comp. <math>(c)</math> (Number of Uninc. Cust.) <math>= d =</math> Uninc. Non-cust. Comp.</li> <li>5 - Customer Comp. <math>=</math> Total Overhead Line Capital - <math>(b+d)</math></li> </ul> </li> <li>B - Remainder of Overhead Line Capital to Demand and Commodity on Load Factor Basis.</li> </ul>

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Capital to Functions (Cont'd)

<u>Code</u>	<u>Allocation Basis</u>
4	Underground Lines A - To Customer 1 - Let $x$ = capital invested in underground lines $y$ = capital which would be invested in equivalent length of overhead lines $a$ = per cent customer component factor developed in 2A3 2 - Customer component = $ay + x - y = x - y(1-a)$ B - Remainder of Underground Line Capital to Demand and Commodity on System Load Factor Basis.
5	Line Transformers A - To Customer 1 - Plot dollars (ordinates) against kva for various size transformers 2 - Extrapolate curve (straight line) to zero x - intercept 3 - To obtain Customer Component multiply zero intercept by number of transformers. B - Transformer Capital minus Customer Component to Demand and Commodity on System Load Factor Basis.
6	To Functions in proportion to allocations of Dist. Sub-Total Capital, Table 1, Line 23, Columns 4, 5, and 6.
7	To Functions in proportion to direct expenses in Table 2, Lines 27 and 37, Columns 4, 5, and 6.
8	To Functions in proportion to allocations on Line 17, Columns 4, 5, and 6.
9	To Functions in proportion to allocations of Sub-Total Direct Capital of the same category.
10	To Functions in proportion to direct expense shown on Table 2, Line 58, Columns 4, 5, and 6.
11	To Functions in proportion to direct expense shown on Table 2, Line 70, Columns 4, 5, and 6.
12	To Functions in proportion to allocations on Line 16, Columns 4, 5, and 6.
13	To Functions in proportion to direct expense shown on Table 2, Line 81, Columns 4, 5, and 6.

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Capital to ClassesClasses:

- |                                     |                            |
|-------------------------------------|----------------------------|
| 1 - Domestic                        | 6 - Resale                 |
| 2 - General Service, Non-demand     | 7 - Street Lighting        |
| 3 - General Service, Demand Metered | 8 - Transmission Delivery  |
| 4 - Agricultural                    | 9 - International Delivery |
| 5 - Other Public Authorities        |                            |

CodeAllocation Basis

- A To classes 1-8, inclusive, in proportion to non-coincident excess demands (class maximum demand at distribution input minus class average demand at distribution input, see Appendix B)
- B To classes 1-8, inclusive, in proportion to class kwhr at distribution input.
- C To classes 1-7, inclusive, in proportion to non-coincident excess demands at input to distribution.
- D To classes 1-7, inclusive, in proportion to class kwhr at distribution input.
- E To classes 1-7, inclusive, in proportion to equivalent number of customers (equivalent number of customers equals number of customers in class times class index).

$$\text{Class Index} = (\text{Class \% inc. cust.}) + \frac{(\text{Class uninc. cust.})(\text{Substation Const. costs uninc.})}{(\text{Substation Construction Costs inc.})}$$

- F To classes 1-7, inclusive, in proportion to equivalent number of customers.

$$\text{Class Index} = (\text{Class \% inc. cust.}) + \frac{(\text{Class \% uninc. cust.})(\text{cust./mi. inc.})(\text{Line Const. costs uninc.})}{(\text{Cust./mi. uninc.})(\text{Line Const. costs inc.})}$$

- G Allocate customer component of underground capital only to classes utilizing underground lines on basis of number of customers of each class served through underground. (May be based on sample analysis.)

- H To classes 1-7, inclusive, in proportion to equivalent number of customers. Class indices to be developed as follows:

- Let
- a = total number of transformers
  - b = total number of customers
  - c = number of agricultural three-phase customers
  - d = total number of three-phase customers
  - e = No. agric. cust. per 3 $\phi$  inst. (May be based on sample analysis.)
  - f = No. non-agric. cust. per 3 $\phi$  inst. (sample analysis)
  - g = No. cust. per 1 $\phi$  installation - inc. (sample analysis)
  - h = No. cust. per 1 $\phi$  installation - uninc. (sample analysis)
  - j = Cost per transformer (zero intercept)
  - k = Class per cent 1 $\phi$  customers
  - m = Class per cent 3 $\phi$  customers

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Capital to Classes (Cont'd)

H (Cont'd) Then -

$c + e = n$  = Number 3 $\phi$  agricultural transf. installations  
 $(d-c) + f = p$  = Number non-agric. 3 $\phi$  transf. installations  
 $a - 3(n+p) = r$  = Number 1 $\phi$  transf. installations  
 $b - d = s$  = Number 1 $\phi$  customers  
 $s + r = t$  = Avg. number customers per 1 $\phi$  transformer  
 $j + t = u$  = Cost per customer for 1 $\phi$  transf. installation  
 $u + (2j + e) = v$  = cost per customer for 3 $\phi$  agric. inst.  
 $u + (2j + f) = w$  = cost per customer for 3 $\phi$  non-agric. inst.  
 Class index =  $\frac{(k)(u) + (m)(v \text{ or } w)}{u}$

I

To classes 1-6, inclusive, in proportion to equivalent number of metered customers: Class indices to be developed as follows:

Let -

$a$  = weighted average cost of single-phase service and meter installation  
 $b$  = weighted average cost of three-phase service and meter installation  
 $c$  = class per cent single-phase metered customers  
 $d$  = class per cent three-phase metered customers

Then -

Class index =  $\frac{(a)(c) + (b)(d)}{a}$

Weighted average costs to be developed by determining unit costs for various size and voltage meters and weighting costs according to number of meters of each size and voltage classification.

J

To classes involved on basis of special analysis of account.

K

To classes 1-7, inclusive, in proportion to allocations of distribution capital on Line 23, Column 9.

L

To classes 1-7, inclusive and 9, in proportion to allocations of distribution direct expenses, Table 2, Lines 27 and 37, Column 9.

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Capital to Areas(cont'd)

<u>Code</u>	<u>Allocation Basis</u>
a	To Northern, Central and Southern Areas in proportion to non-coincidental excess demands (area maximum demand at distribution input minus area average demand at distribution input).
b	To Northern, Central and Southern Areas in proportion to area kwhr at distribution input.
c	Assign directly to Northern, Central and Southern Areas as located.
d	To Northern, Central and Southern Areas in proportion to allocations of Sub-Total Distribution Capital on Line 23, Column 13.
e	Assign cost of franchises to Northern, Central and Southern Areas directly as located. Allocate organization to Northern, Central and Southern Areas in proportion to allocations of Sub-Total Distribution Capital on Line 23, Column 13.
f	Allocate by accounts to Northern, Central and Southern Areas, in proportion to allocations of corresponding capital on Lines 16 to 24, inclusive, Column 13.
g	To Northern, Central, Southern and International Areas in proportion to allocations of direct distribution expense, Table 2, Lines 27 and 37, Column 13.
h	To Northern, Central and Southern Areas in proportion to the sums of number of non-metered street lights and number of meters.
i	Assign cost of franchises to Northern, Central and Southern Areas, directly as located. Allocate organization to Northern, Central and Southern Areas in proportion to allocations of street lighting direct capital, Line 39, Column 13.
j	To Northern, Central and Southern Areas in proportion to allocations of street lighting direct capital, Line 39, Column 13.
k	To Northern, Central and Southern Areas in proportion to allocations of street lighting direct expenses, Table 2, Line 58, Column 13.



TABLE 2 - Sheet 1 of 4  
CODES FOR ALLOCATION OF EXPENSE

4-32188

Line No.	Expense	Functional Code to Class												
		Code to: Category	Total Expense	Code to: Function	Component	Dem	Comm	Cust	Dem	Comm	Cust	Dem	Comm	Cust
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Production and Transmission (Excl. TD and IND)</u>														
1	Production Exp. (Excl. Ind. Purch.)	Dir	x	14	x	x	-	M	N	-	1	m	-	-
2	Transmission (Excl. TD Dir)	Dir	x	14	x	x	-	M	N	-	1	m	-	-
3	Subtotal Prod. & Trans. Dir.		x		x	x	-							
4	<u>Other Items</u>													
5	Administrative & General	VIII	x	14	x	x	-	M	N	-	1	m	-	-
6	Dep'n Annuity & Int. Prod. & Trans.	X	x	14	x	x	-	M	N	-	1	m	-	-
7	Dep'n Annuity & Int. GP	XV	x	14	x	x	-	M	N	-	1	m	-	-
8	Rent from P&T Prop. Cred. (Ac. 610)	Dir	x	14	x	x	-	M	N	-	1	m	-	-
9	<u>Taxes Other than Income (Excl. St. Lt., TD &amp; IND)</u>													
10	Ad Valorem	IX	x	14	x	x	-	M	N	-	1	m	-	-
11	Pay Roll - Prod. & Trans.	Dir	x	14	x	x	-	M	N	-	1	m	-	-
12	Pay Roll - Adm. & Gen.	VIII	x	14	x	x	-	M	N	-	1	m	-	-
13	Other	XVI	x	14	x	x	-	M	N	-	1	m	-	-
14	Subtotal Other Items		x		x	x	-							
15	Income Taxes (Fed. & State Fran.)	IX	x	14	x	x	-	M	N	-	1	m	-	-
16	Return at 6% on Net Capital	IX	x	14	x	x	-	M	N	-	1	m	-	-
17	Total Prod. & Trans. Costs		x		x	x	-							
<u>Distribution</u>														
18	<u>Distribution Operation (Excl. St. Lt., TD &amp; IND)</u>													
19	Supv., Engr., Maps & Other	Dir	x	15	x	x	x	O	O	O	<del>X</del>			n
20	Sta. Labor, Suppl. & Dispatching (Excl. IND)	Dir	x	16	x	x	x	P	Q	R				o
21	Overhead Lines (Excl. IND)	Dir	x	16	x	x	x	P	Q	R				o
22	Underground Lines	Dir	x	16	x	x	x	P	Q	R				o
23	R & R Transformers	Dir	x	16	x	x	x	P	Q	R				o
24	R & R Mtrs (Excl. TD & IND)	Dir	x	Dir	-	-	x	-	-	S				o
25	Other Services on Cust. Premises	Dir	x	Dir	-	-	x	-	-	T	o			
26	Servicing of Cust. Installations Credit (Acot. 614)	Dir	x	Dir	-	-	x	-	-	T	o			
	Subtotal Dist. Oper. Direct		x		x	x	x							

APPENDIX A - Page 15 of 24

TABLE 2 - Sheet 2 of 4  
CODES FOR ALLOCATION OF EXPENSE

A-32188

Line No.	Expense	Functional			Code to Class			Code to Area			Total			
		Code to Category	Total Expense	Code to Function	Component	Dem	Comm	Cust	Dem	Comm		Cust		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Distribution (Cont'd)</u>														
28	Distribution Maint. (Excl. St. Lt., TD & IND)													
29	Supervision & Engineering	Dir	x	17	x	x	x	U	U	U				P
30	Struct. & Sta. Equip. (Excl. IND)	Dir	x	16	x	x	x	P	Q	R				P
31	Poles, Towers, Fix. & OL (Excl. IND)	Dir	x	16	x	x	x	P	Q	R				P
32	Underground Conduit & Conductors	Dir	x	16	x	x	x	P	Q	R				P
33	Transformers	Dir	x	16	x	x	x	P	Q	R				P
34	Services	Dir	x	Dir	-	-	x	-	-	R				P
35	Meters (Excl. TD & IND)	Dir	x	Dir	-	-	x	-	-	S				P
36	Installations on Cust. Premises	Dir	x	Dir	-	-	x	-	-	T				P
	Subtotal Dist. Maint. Dir.		x		x	x	x							P
38	Other Items													
39	Administrative & General	VIII	x	18	x	x	x	V	V	V				V
40	Sales Promotion	Dir	x	Dir	-	-	x	-	-	W				V
41	Customers Acctg. & Collecting	Dir	x	Dir	-	-	x	-	-	X				V
42	Dep'n Annuity & Int., Dist.	XI	x	19	x	x	x	P	Q	Y				V
43	Dep'n Annuity & Int., GP	XV	x	19	x	x	x	P	Q	Y				V
44	Distribution Rents	Dir	x	19	x	x	x	P	Q	Y				V
45	Rent from Dist. Property - Credit (Acct. 610)	Dir	(x)	19	(x)	(x)	(x)	P	Q	Y				V
46	Misc. Revenue-Credit (Acct. 615)	Dir	(x)	19	(x)	(x)	(x)	P	Q	Y				V
47	Taxes Other Than Income (Excl. St. Lt., TD & IND)													
48	Ad Valorem	IX	x	20	x	x	x	Z	Z	Z				V
49	Pay roll-Dist., Cust. A&C, Sales Pro.	Dir	x	18	x	x	x	V	V	V				V
50	Pay roll - Adm. & Gen.	VIII	x	18	x	x	x	V	V	V				V
51	Other	XVI	x	20	x	x	x	Z	Z	Z				V
52	Subtotal Other Items		x		x	x	x							V
53	Income Taxes (Fed. & State Fran.)	IX	x	20	x	x	x	Z	Z	Z				V
54	Return at 6% on Net Capital	IX	x	20	x	x	x	Z	Z	Z				V
55	Total Distribution Costs		x		x	x	x							V

APPENDIX A - Page 16 of 24

TABLE 2 - Sheet 3 of 4  
CODES FOR ALLOCATION OF EXPENSE

Line No.	Expense	Functional Code to Class												
		Code to Category	Total Expense	Code to Function	Dem	Comm	Cust	Dem	Comm	Cust	Dem	Comm	Cust	Total
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>Street Lighting</u>														
56	Operation	Dir	x	21	x	x	x							0
57	Maintenance	Dir	x	22	x	x	x							0
58	Subtotal St. Lt. Direct		x		x	x	x							
59	Administrative & General	VIII	x	23	x	x	x							W
60	Dep'n Annuity & Int. St. Lt.	XII	x	24	x	x	x							Y
61	Dep'n Annuity & Int. GP	XV	x	24	x	x	x							Y
62	Taxes Other Than Income	XVI	x	20	x	x	x							Z
63	Income Taxes	IX	x	20	x	x	x							Z
64	Return at 6% on Net Plant	IX	x	20	x	x	x							Z
65	Total St. Lt. Category		x		x	x	x							
<u>Transmission Delivery</u>														
66	Operation	Dir	x	14	x	x	--							
67	Maintenance	Dir	x	14	x	x	--							
68	R & R Meters	Dir	x	Dir	--	--	x							
69	Meter Maintenance	Dir	x	Dir	--	--	x							
70	Subtotal TD Direct		x		x	x	x							
71	Administrative & General	VIII	x	23	x	x	x							
72	Dep'n Annuity & Int. TD	XIII	x	24	x	x	x							
73	Dep'n Annuity & Int. GP	XV	x	24	x	x	x							
74	Taxes Other Than Income	XVI	x	20	x	x	x							
75	Income Taxes	IX	x	20	x	x	x							
76	Return at 6% on Net Plant	IX	x	20	x	x	x							
77	Total Trans. Del'y Category		x		x	x	x							

TABLE 2 - Sheet 4 of 4

A-32188

CODES FOR ALLOCATION OF EXPENSE

Line No.	Expense	Code to			Functional Component			Code to Class of Service			Code to Area			Total
		Category	Expense	Function	Dem	Comm	Cust	Dem	Comm	Cust	Dem	Comm	Cust	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<u>International Delivery</u>														
78	Purchased Power	Dir	x	25	x	x	-							
79	Oper-Land, Sta, Equip., OL & Meters	Dir	x	26	x	x	x							
80	Maint-Land, Sta, Equip., OL & Meters	Dir	x	27	x	x	x							
81	Subtotal IND Direct		x		x	x	x							
82	Administrative and General	VIII	x	23	x	x	x							
83	Dep'n Annuity & Int. IND	XIV	x	24	x	x	x							
84	Dep'n Annuity & Int. GP	XV	x	24	x	x	x							
85	Taxes Other Than Income	XVI	x	20	x	x	x							
86	Income Taxes	IX	x	20	x	x	x							
87	Return at 6% on Net Plant	IX	x	20	x	x	x							
88	Total IND Category		x		x	x	x							
89	TOTAL COSTS		x		x	x	x							

APPENDIX I - Page 18 of 24

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocations of Expenses to Categories

<u>Code</u>	<u>Allocation Basis</u>
VIII	Allocate to all categories in proportion to total direct expenses excluding purchased power. (Lines 3, 27, 37, 58, 70 and 81)
IX	Assign to all categories in proportion to net capital shown in Table 1, Lines 15, 35, 46, 56 and 67.
X	Depreciation Expense for Capital in Table 1, Line 3
XI	Depreciation Expense for Capital in Table 1, Line 25
XII	Depreciation Expense for Capital in Table 1, Line 39
XIII	Depreciation Expense for Capital in Table 1, Line 49
XIV	Depreciation Expense for Capital in Table 1, Line 60
XV	Allocate to all categories in proportion to direct capital shown in Table 1, Lines 3, 25, 39, 49 and 60.
XVI	By special analysis.

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Expenses to Functions

<u>Code</u>	<u>Allocation Basis</u>
14	Load Factor Basis - Main and Blythe Systems Combined: Commodity component equals dollar amount times 1951 system load factor.
15	In proportion to Total Distribution Operation excluding Supervision, Engineering, Maps & Other, line 27 minus line 18, columns 4, 5 and 6.
16	In proportion to capital allocations for corresponding plant, Table 1, lines 16-19, inclusive, columns 4, 5 and 6.
17	In proportion to Total Distribution Maintenance excluding Supervision and Engineering, line 37 minus line 29, columns 4, 5 and 6.
18	In proportion to totals of lines 27, 37, 40 and 41, columns 4, 5 and 6.
19	In proportion to Capital, Table 1, line 23, columns 4, 5 and 6.
20	In proportion to Net Capital of the same category.
21	In proportion to Distribution Operation, line 27.
22	In proportion to Distribution Maintenance, line 37.
23	In proportion to Direct Expenses of the same category.
24	In proportion to Subtotal Direct Capital of the same category.
25	Load Factor Basis for International Delivery.
26	In proportion to the totals of lines 20, 21 and 24, columns 4, 5 and 6.
27	In proportion to the totals of lines 30, 31 and 35, columns 4, 5 and 6.

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Expenses to ClassesClasses:

- |                                     |                            |
|-------------------------------------|----------------------------|
| 1 - Domestic                        | 6 - Resale                 |
| 2 - General Service, Non-demand     | 7 - Street Lighting        |
| 3 - General Service, Demand Metered | 8 - Transmission Delivery  |
| 4 - Agricultural                    | 9 - International Delivery |
| 5 - Other Public Authorities        |                            |

CodeAllocation Basis

- M To classes 1-8, inclusive, in proportion to non-coincident excess demands (class maximum demand at distribution input minus class average demand at distribution input, see Appendix B).
- N To classes 1-8, inclusive, in proportion to class kwhr at distribution input.
- O To classes 1-7, inclusive, and 9, in proportion to total distribution operating expenses, excluding supervision, engineering, maps and other; total of lines 27, 56 and 79, minus line 19 - columns 7, 8 and 9, respectively.
- P To class 1-7, inclusive, in proportion to non-coincident excess demands at input to distribution.
- Q To classes 1-7, inclusive, in proportion to class kwhr at distribution input.
- R To classes in proportion to allocations of corresponding capital items, Table 1, lines 16 to 20, respectively, column 9.
- S To classes 1-7, inclusive, in proportion to equivalent number of customers developed as follows:
1. Segregate testing from turn-ons and turn-offs.
  2. Develop class indices on frequency and time basis for these segregations.
  3. Final class index equals weighted average of two indices.
  4. Equivalent number of customers equals number of customers in class times class index.

## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Expenses to Classes (cont'd)

<u>Code</u>	<u>Allocation Basis</u>
T	To classes 1-7, inclusive, by judgment based on discussions with personnel.
U	To classes 1-7, inclusive, and 9, in proportion to total distribution maintenance expenses, excluding supervision and engineering; total of lines 37, 57 and 80, minus line 29, columns 7, 8 and 9, respectively.
V	To classes 1-9, inclusive, in proportion to totals of lines 27, 37, 40 and 41, columns 7, 8 and 9, respectively.
W	To classes 1-9, inclusive, in proportion to equivalent number of customers developed as follows: <ol style="list-style-type: none"> <li>1. Assign class indices to following segregations by judgment based on discussions with personnel: Supervision, Salaries &amp; Commissions, Demonstrations, Advertising, Merchandising and Contract Work, and Miscellaneous.</li> <li>2. Equivalent number of customers in a class equals weighted class index times number of class customers.</li> </ol>
X	To classes 1-9, inclusive, in proportion to equivalent number of customers developed as follows: <ol style="list-style-type: none"> <li>1. Assign class indices to segregations as follows:               <ol style="list-style-type: none"> <li>a. Supervision - on basis of supervisor's judgment.</li> <li>b. Contracts and orders - on basis of judgment of personnel.</li> <li>c. Meter reading - Let a = ratio of reading costs uninc. to inc., b = per cent inc. cust. in each class and c = per cent uninc. cust. in each class. Then class index = b + ac.</li> <li>d. Collecting - on basis of judgment of personnel.</li> <li>e. Cust. Billings &amp; Accounting - Indices based on relative time spent in computing class bills.</li> <li>f. Uncollectible - on basis of class revenues.</li> <li>g. Miscellaneous on basis of totals of "a" through "f".</li> </ol> </li> <li>2. Obtain weighted class indices and develop equivalent number of customers for each class.</li> </ol>
Y	To classes 1-7, inclusive, in proportion to allocations of distribution capital in Table 1, line 23, column 9.
Z	To classes 1-7, inclusive, and 9, in proportion to allocations of distribution net capital, Table 1, line 35, columns 7, 8 and 9, respectively.



## C - CAPITAL AND EXPENSE ALLOCATIONS

Codes for Allocation of Expense to Areas

<u>Code</u>	<u>Allocation Basis</u>
l	To Northern, Central and Southern Areas in proportion to non-coincidental excess demands (area maximum demand at distribution input minus area average demand at distribution input).
m	To Northern, Central and Southern Areas in proportion to area kwhr at distribution input.
n	To Northern, Central, Southern and International Areas in proportion to direct distribution operating expenses excluding Supervision, Engineering, Maps and Other; totals of Lines 27, 56 and 79, minus Line 19 - Column 13.
o	Assign directly to Northern, Central and Southern Areas as located.
p	To Northern, Central, Southern and International Areas in proportion to direct distribution maintenance expenses excluding Supervision and Engineering; totals of Lines 37, 57 and 80, minus Line 29, Column 13.
q	Assign located portion to Northern, Central and Southern Areas directly as located. Allocated unlocated portion to Northern, Central, Southern and International Areas in proportion to allocations of direct meter capital, Table 1, totals of Lines 21, 38; 48 and 59, Column 13.
r	To Northern, Central, Southern and International Areas in proportion to totals of Lines 27, 37, 40 and 41, Column 13.
s	To Northern, Central, Southern and International Areas on basis of data developed under special analysis for class allocations Code W.
t	To Northern, Central, Southern and International Areas on basis of data developed under special analysis for class allocations Code X.
u	To Northern, Central and Southern Areas in proportion to allocation of Sub-Total Distribution Capital in Table 1, Line 23, Column 13.
v	To Northern, Central, Southern and International Areas in proportion to allocations of Distribution Net Capital, Table 1, Line 35, Column 13.
w	To Northern, Central and Southern Areas in proportion to allocations of street lighting direct expenses, Line 58, Column 13.
y	To Northern, Central and Southern Areas in proportion to street lighting direct capital, Table 1, Line 39, Column 13.
z	To Northern, Central and Southern areas in proportion to street lighting net capital, Table 1, Line 46, Column 13.

D - COMPARISONS OF COSTS AND REVENUES

Summary tables, one by classes of service and the other by areas, will show the cost, the revenues, the excess or deficiency of revenues over costs, and the percentage excess or deficiency of revenue over costs for each class or area.

The estimated revenues for general service delivery are to be prorated between nondemand and demand metered revenues in proportion to the recorded revenues from deliveries to the same classes during 1951. The estimated revenues for the test year 1951 are to be prorated to areas by classes in proportion to the recorded class revenues during 1951.

Revenues shown in these tables will not include \$574,000 estimated revenue other than from sales of energy. That amount was taken out as a credit to expenses in preparation of the costs. Accordingly, the gross operating revenue from sales and deliveries of electric energy will be \$11,566,507.

CALIFORNIA ELECTRIC POWER COMPANY  
METHODS FOR DETERMINATION OF  
CLASS DEMANDS, LOSSES, DISTRIBUTION INPUT, AND SYSTEM PEAK  
FOR  
COST OF SERVICE ALLOCATION STUDIES

Part I - Method of Obtaining Class Demands, Excluding KW Losses

A - Demand costs are to be allocated to classes or areas on the basis of class or area noncoincident excess demands. However, to serve as a check on the assumptions and judgment figures, the coincident class demands at the time of system winter peak also will be calculated. (The sum of coincident class demands at distribution input, which includes distribution losses, plus substation and transmission losses at time of system peak, should equal system maximum demand at generation.)

Class demands are to be obtained as follows:

Recording demand meters will be set on typical domestic and general service (Non-demand) substations or circuits for a period of one week. Data from these charts will be weighted and consolidated so that the time and day of peak may be ascertained. This peak day will be taken as representative of day of system peak.

1. Domestic:

- a. Obtain from chart data the following figures for the sample domestic classification:
  - (1) Demand at time and day of system peak,
  - (2) Maximum demand,
  - (3) Average weekly demand.
- b. Multiply sample average demand by ratio of system average demand at meters to system average demand at distribution input, and multiply sample maximum demand by ratio of system maximum demand at meters to system maximum demand at distribution input. Divide the adjusted sample average demand by the adjusted sample maximum demand to obtain sample domestic load factor at meters. The system average and maximum demands used above should be computed for the month of system peak using the formula set forth in Part III - A.
- c. From kilowatt-hour sales compute average class demand for monthly period which includes day of system peak and divide by sample domestic load factor obtained in I-A-1-b to obtain domestic maximum demand, excluding kw losses at customers' meters.

Part I - Method of Obtaining Class Demands, Excluding KW Losses (cont'd)

- d. Multiply figure obtained in "c" by ratio of sample demand at time and day of system peak to sample maximum demand to obtain class demand, excluding kw losses, at time of system peak.
2. General Service (Non-demand)
    - a. Obtain class demand at time of system peak and maximum class demand as in (1) above.
  3. General Service (Demand)

Customers with recording demand meters

- a. Obtain sum of individual demands at time of system peak and also maximum coincident demand.

Customers with indicating demand meters

- b. Obtain sum of noncoincident demands and apply diversity factor in range 1.10 to 2.24 to obtain class maximum demand. Selection of diversity factor used here may be based on diversity factor obtained for customers with recording demand meters under I-A-3-a. Assuming ratio of maximum coincident demand to demand at system peak is the same as in "a", compute maximum demand.
  - c. Combine results of "a" and "b" to obtain class maximum demand and class demand at time of system peak.
4. Agricultural
    - a. Obtain agricultural class total maximum demand and also irrigation customers' maximum demand (summer peaks) by analysis of connected load.
    - b. Obtain winter peak by subtracting summer irrigation peak from total agricultural class summer peak and multiplying difference by ratio of February domestic sales to July domestic sales.

## 5. Other Public Authorities

- a. Compute class maximum demand and demand at time of system peak from analysis of connected load.

## 6. Resale

- a. Obtain demand at time of system peak from analysis of charts of individual customers.
- b. Obtain annual maximum coincident demand from analysis of charts of individual customers.

Part I - Method of Obtaining Class Demands, Excluding KW Losses (cont'd)

## 7. Street Lighting

- a. Obtain demand at time of system peak from consideration of connected load.
- b. Obtain class maximum demand from consideration of connected load.

## 8. Transmission Delivery

- a. Obtain demand at time of system peak from analysis of charts of individual customers.
- b. Obtain annual maximum coincident demand from analysis of charts of individual customers.

## 9. International Delivery

- a. Obtain maximum demand from analysis of chart.

B - The maximum class demands developed in I-A above, after adjustment for distribution losses as developed in Part IV, establish the demand relationship between classes for the most recent annual period. It will be assumed that this same relationship existed during 1951.

Part II - Allocation of Kwhr Losses to Classes and Determination of Class Kwhr at Distribution Input

A - Ascertain core losses of distribution transformers (excluding substation transformers) and allocate to classes in same percentages that customer component of transformer capital is allocated to classes (Table 1, Line 20, Col. 9). Allocate kilowatt-hour class core losses to months in ratio of 1/12 annual losses.

B - Compute, using judgment where necessary, distribution line kilowatt-hour copper losses for Street Lighting (including losses to constant-current transformers), General Service - Demand, Resale, and Other Public Authorities.

C - Deduct sum of A and B from total distribution losses between distribution substations and sales to customers. The remaining losses will be allocated to Domestic, General Service - Non-demand, and Agricultural as follows:

1. Let  $N_d$ ,  $N_g$ ,  $N_a$ , equal number of customers per mile of line for the respective classes. (To be obtained by sampling.  $N_d$  should include rural domestic customers).
2. Then number of class customers divided by  $N_d$ ,  $N_g$ ,  $N_a$ , = miles of line for each class ( $M_d$ ,  $M_g$ ,  $M_a$ ).

Part II - Allocation of Kwhr Losses to Classes and Determination of Class Kwhr at Distribution Input (cont'd)

3. Using 2300/4000V volts as base, multiply  $M_d, M_g, M_a$ , by inverse ratio squared of class voltage to 4,000 volts to obtain equivalent miles of line for each class ( $E_d, E_g, E_a$ ). This step to be used only if higher voltage used almost exclusively for a particular class.
4.  $E_d, E_g, E_a \div (\text{class power factor})^2 = F_d, F_g, F_a$ .
5. Let  $S_d, S_g, S_a$  = class sales, then  $S_d \div M_d$ , etc. = kwhr sales per mile ( $G_d, G_g, G_a$ ) of line.
6.  $G_d \times F_d$  etc. =  $X_d, X_g, X_a$ .
7.  $X_d \times (\text{Dom. Load Factor})^{1.6} = Y_d$ .  $X_g \times (\text{Gen. Serv. Load Factor})^{1.6} = Y_g$ .  $X_a \times (\text{Agric. Load Factor})^{1.6} = Y_a$ .
8. Allocate annual remaining kwhr losses to classes in same percentage that  $Y_d, Y_g, Y_a$  bear to Y total.

D - Allocate annual class distribution line losses to months in same percentages that monthly kilowatt-hour sales bear to annual kilowatt-hour sales.

E - For purposes of assigning commodity component to the Transmission Delivery and International Delivery classes, the sales plus distribution losses on the International Delivery will be considered as Class Kwhr at distribution input.

F - Class Kwhr sales plus transformer kwhr core losses (A above) plus line distribution kwhr losses (B and C above) equals Class Kwhr at distribution input for classes 1 through 7.

Part III - System Peak

A - Using system load factor for month of system peak, obtain per cent equivalent hours from the following table by interpolation:

Per Cent Load Factor	50	60	70	80	90
Per Cent Equivalent Hours	33	43	56	69	84

Compute system kw loss at time of peak from

$$\text{kw peak loss} = \frac{\text{kwhr loss (month)}}{\text{per cent equivalent hours} \times .24 \times \text{days in month}}$$

Part IV - Determination of Class Excess Noncoincident Demands at Distribution Input

A - Determine class load factor at meter by dividing class sales for month of maximum class demand by the product of the number of hours in the month and the class maximum demand at meters (from Part I).

B - Multiply class load factor at meter by ratio of system load factor at distribution to system load factor at meter (month of system peak) to obtain class load factor at distribution input.

C - Divide class maximum monthly kwhr at distribution input (obtained from Part II) by product of hours in month and class load factor at distribution input (B above) to obtain maximum noncoincident class demand for classes 1 through 7.

Maximum demands obtained in Part I-A-8-b and I-A-9-a will be considered maximum noncoincident demands for Transmission Delivery and International Delivery.

D - Class annual kwhr at distribution input (Part II) divided by 8760 equals class average annual demand.

E - Class excess demand equals class maximum noncoincident demand (C above) minus class average annual demand (D above).