

CHICAGO NORTH SHORE AND MILWAUKEE RAILROAD COMPANY
Annual Report
Electrical Department
Year 1928

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POWER STATISTICS FOR YEAR 1928

Power Distribution

		<u>K.W.H.</u>
In Wisconsin exclusive of Milwaukee City	A.C.	11558841
In Milwaukee City	D.C.	1678840
	A.C.	<u>2135473</u>
In Wisconsin including Milwaukee City	A.C.	13794314
In Milwaukee D.C. furnished by T.M.E.R.&L.Co.	D.C.	<u>1063746</u>
In Wisconsin Total	A.C. & D.C.	14858060
In Illinois Total	A.C. & D.C.	<u>34475358</u>
Total purchased all sources	A.C. & D.C.	49333418
Average monthly K.W. maximum demand for year		9140
A.C. K.W.H. purchased	" "	45287079
Load Factor	" "	56.7%

CHICAGO NORTH SHORE AND MILWAUKEE RAILROAD COMPANY

Cost of Electrical Energy Per Car Mile

K.W.H. for Year 1928

C.N.S. & M.R.R. and C. & M.E. Ry.

January	4319975
February	4140939
March	4203427
April	4014987
May	4016953
June	3893668
July	3938816
August	4015940
September	4062038
October	4143857
November	4186577
December	4396252
	<u>49333418</u>

Car Miles for Year 1928

C.N.S. & M.R.R. and C. & M.E. Ry.

January	921923
February	894011
March	934748
April	905041
May	990029
June	967854
July	1021010
August	1064800
September	999770
October	1011068
November	923154
December	953201
	<u>11586609</u>

Total C.N.S. & M.R.R.Co. and C. & M.E. Ry. Car Miles

11,586,609

Cost of Power Year 1928

\$ 519,739.00

$519,739.00 \div 49,333,418 = \$.010535$ per K.W.H.

$49333418 \div 11586609 = 4.258$ K.W.H. per Car Mile

$4.258 \times .010535 = \$.044858$

Net Cost of Electric Energy Per Car Mile

4.486¢

Net Cost of Electric Energy Per Car Mile at Car

5.16¢

Note above costs do not include interest on investment, insurance, depreciation and taxes.

POWER SUMMARY YEAR 1928.

540500	D.C.	K.W.H.	Winthrop Harbor Substation to Wisconsin			
495650	D.C.	"	McKeown	"	"	"
1288680	D.C.	"	Kenosha	"	"	"
598390	D.C.	"	Rose Road	"	"	"
1180900	D.C.	"	Racine	"	"	"
260800	D.C.	"	Racine Quarry	"	"	"
1148510	D.C.	"	4 Mile	"	"	"
755300	D.C.	"	Carrollville	"	"	"
1424200	D.C.	"	College	"	"	"
2666600	D.C.	"	Milwaukee	"	"	"
<u>10859580</u>	±-	75-1	13794314			

13794314	A.C.	K.W.H.		to Wisconsin
1063746	D.C.	K.W.H.	T.F.E.R. & L.Co.	" "
<u>14858360</u>	Total	A.C. and D.C.	K.W.H.	" "

13794314	A.C.	K.W.H.		" "
2235473	Milwaukee City	A.C.	D.C. 1678840	
<u>11558841</u>		K.W.H. consumed in Wisconsin	except of Milwaukee City.	

6214627	Skokie Valley	A.C.		
94892	Evanston	A.C.		
13985741	Lake Bluff	A.C.		
11902116	Waukegan	A.C.		
3923506	Winthrop Harbor	A.C.		
<u>6625904</u>	Milwaukee	A.C.		
<u>42946786</u>	Total	A.C.		
1388134	Central St.	D.C.	plus losses	
952159	Niles Center	D.C.	plus losses	
2982593	Niles Center Branch	D.C.		
<u>1063746</u>	Milwaukee	D.C.		
<u>49333418</u>	Total purchased	A.C. and D.C.		

1076210	#1 Substation	D.C.		
278000	#2	"	D.C.	
822320	#3	"	D.C.	
823862	#4	"	D.C.	
504160	#5	"	D.C.	
3021000	Winnetka	"	D.C.	
2740010	Ravinia	"	D.C.	
2969800	Pt. Sheridan	"	D.C.	
952590	Liberty Lake	"	D.C.	
2637050	Lake Bluff	"	D.C.	
3227770	No. Chicago	"	D.C.	
1757740	Beach	"	D.C.	
1621500	Winthrop Harb.	D.C.		
495650	McKeown	D.C.		
1288680	Kenosha	D.C.		
598390	Rose Road	D.C.		
1180900	Racine	D.C.		
260800	Racine Quarry	D.C.		
1148510	4 Mile	D.C.		
755300	Carrollville	D.C.		
1424200	College	D.C.		
<u>2666600</u>	Milwaukee	D.C.		
<u>32253062</u>				

$\frac{42946786}{32253062} = 75.1\%$

POWER STATISTICS FOR YEAR 1928
Skokie Valley Line 60 Cycle System.
Dempster St. to Mundelein.

	<u>D.C.</u> <u># 1.</u>	<u>D.C.</u> <u># 2.</u>	<u>D.C.</u> <u># 3.</u>	<u>D.C.</u> <u># 4.</u>	<u>D.C.</u> <u># 5.</u>	<u>D.C.</u> <u>Lib.</u> <u>Lake</u>
Jan.	87270	35500	53900	88435	12820	85960
Feb.	63930	24000	81300	41100	53900	77720
March	88870	31200	65820	46887	48170	66170
April	72860	28800	57900	63440	36330	90190
May	93960	22000	41900	111600	-	72120
June	97790	17800	54500	86200	15310	69750
July	103740	18400	72100	51600	59940	64650
Aug.	121500	24900	45700	85100	49610	91720
Sept.	108210	16500	65000	79900	45640	82420
Oct.	96500	20000	85800	78700	45400	82250
Nov.	78860	19400	94700	51200	65100	85720
Dec.	63720	19500	103700	41700	71960	83920
	<u>1078210</u>	<u>278000</u>	<u>622320</u>	<u>625562</u>	<u>504160</u>	<u>952590</u>

	<u>A.C.</u>	<u>A.C.</u>	<u>A.C.</u>	<u>A.C.</u>	<u>A.C.</u>	<u>A.C.</u>
Jan.	117900	68250	74700	69219	17650	121475
Feb.	92100	43500	96900	75729	42250	108648
March	104600	56100	105626	76955	58500	95972
April	99300	54300	81000	91080	45600	126303
May	127200	45900	54000	148650	-	101650
June	134100	31200	74700	119850	24750	101250
July	141900	37800	86400	75050	77400	88650
Aug.	171600	53100	69900	122430	66300	124200
Sept.	157200	35400	84900	106820	60000	111900
Oct.	137700	42900	111600	105790	58800	108900
Nov.	112500	44850	123300	74540	77850	115650
Dec.	90900	44400	139500	64240	84900	115950
	<u>1487000</u>	<u>557700</u>	<u>1102526</u>	<u>1131353</u>	<u>615300</u>	<u>1320748</u>

Input A.C. K.W.H. 6,214,627
Output D.C. K.W.H. 4,459,162
Efficiency 71.9%

POWER STATISTICS FOR YEAR 1928
 MAIN LINE
 60 Cycle System Winthrop Harbor & Kenosha

	<u>D.C. Winthrop Harbor</u>	<u>D.C. Kenosha.</u>
Jan.	148500	106520
Feb.	134000	114350
March	140000	121800
April	141100	109260
May	131300	98420
June	99400	84320
July	123000	115420
Aug.	141600	85780
Sept.	119000	105490
Oct.	139700	112540
Nov.	153700	121650
Dec.	150100	113120
	<u>1621500</u>	<u>1288680</u>

A.C. Winthrop Harbor and Kenosha

Jan.	341034
Feb.	331984
March	347070
April	336016
May	313872
June	256530
July	327000
Aug.	297000
Sept.	309000
Oct.	350000
Nov.	357000
Dec.	375000
	<u>3923506</u>

Input A.C. K.W.H.	3923506
Output D.C. K.W.H.	2910180
Efficiency	74.2%

POWER STATISTICS FOR YEAR 1928
 Shore Line 60 Cycle System.
 Linden Ave. to No. Chicago Jct.

	<u>D.C. Winnetka</u>	<u>D.C. Ravinia</u>	<u>D.C. Ft. Sheridan</u>	<u>D.C. Lake Bluff</u>
Jan.	277600	243480	250000	242300
Feb.	258300	228910	239300	215190
March	240900	240640	236800	216050
April	245100	215910	233100	181220
May	252200	213820	254700	253880
June	219400	206180	225700	243480
July	230700	245340	251600	200260
Aug.	229900	238130	244200	194930
Sept.	220700	206210	245200	175230
Oct.	262300	226760	249200	227690
Nov.	270500	234350	266100	245210
Dec.	313400	240280	273900	243610
	<u>3021000</u>	<u>2740010</u>	<u>2989600</u>	<u>2667050</u>

	<u>A.C. Lake Bluff</u>	<u>A.C. Evanston.</u>
Jan.	1234000	11947
Feb.	1151000	-
March	1163947	-
April	1089000	-
May	1192316	7947
June	1141947	-
July	1096947	35789
Aug.	1127421	15368
Sept.	1064449	-
Oct.	1162721	-
Nov.	1252993	-
Dec.	1269000	23841
	<u>12985741</u>	<u>94892</u>

Input A.C. K.W.H. 14,060,633
 Output D.C. K.W.H. 11,267,860
 Efficiency 80.7%

POWER STATISTICS FOR YEAR 1928.

Main Line 25 Cycle System.

North Chicago to Milwaukee.

	<u>D.C. No. Chi.</u>	<u>D.C. Beach.</u>	<u>D.C. McKeown</u>	<u>D.C. Rose</u>	<u>D.C. Racine</u>	<u>D.C. Quarry</u>	<u>D.C. 4 Mile</u>
Jan.	340160	153160	35300	59800	103300	21300	81630
Feb.	297800	157890	33950	48310	99800	23000	81900
March	323750	145040	31000	34370	106300	22200	104260
April	303180	127170	63050	53250	93600	20500	99350
May	275190	132710	51450	63440	83900	16400	96130
June	278700	155130	32400	67840	80600	20200	98090
July	268510	147250	60700	34630	101200	19100	96900
Aug.	214810	137500	49100	62070	108500	29200	95290
Sept.	225440	159490	47300	46400	106800	16000	88770
Oct.	212610	164150	34350	53890	112000	19400	101030
Nov.	239290	135470	25550	39760	91700	20400	106080
Dec.	248330	143280	31500	34630	93200	23100	99060
	<u>3227770</u>	<u>1757740</u>	<u>495650</u>	<u>596390</u>	<u>1180900</u>	<u>260800</u>	<u>1148510</u>

	<u>D.C. Carrollville</u>	<u>D.C. College</u>	<u>D.C. Milwaukee</u>	<u>A.C. Waukegan</u>	<u>A.C. Milwaukee</u>
Jan.	69600	133150	216800	1170976	570140
Feb.	62900	130400	251000	1109648	568690
March	71600	127650	256400	1115108	562136
April	55650	144700	231500	1042763	537834
May	57250	135900	211800	928001	562252
June	53650	129700	215400	915428	592586
July	52800	106400	215100	912795	563992
Aug.	51450	117800	184200	900608	546824
Sept.	66750	94200	200900	994697	578260
Oct.	72900	100950	215800	952127	601054
Nov.	71250	98200	227300	870383	569038
Dec.	69300	105150	240400	979583	573098
	<u>755300</u>	<u>1424200</u>	<u>2668600</u>	<u>11902116</u>	<u>6825904</u>

Input A.C. K.W.H. 18,728,020
 Output D.C. K.W.H. 13,515,860
 Efficiency 72.2%

POWER STATISTICS FOR YEAR 1928
 Main Line Direct Current.
 Howard to Dempster St.
 Power Furnished by C. R. T. Company.

	<u>D.C. Calvary</u>	<u>D.C. Hiles Center</u>
Jan.	139300	114200
Feb.	130180	113180
March	168940	92090
April	141590	106650
May	139230	105030
June	144670	96000
July	136240	100860
Aug.	140660	102860
Sept.	169070	119316
Oct.	113611	93316
Nov.	142940	112540
Dec.	140420	119680
	1706851	1275742

Misc. Power Furnished by P.S.Co. Through the C.R.T.Co. and
 by The T.M.E.R. & L.Co.

	<u>A.C. Hiles Center</u>	<u>A.C. Central St.</u>	<u>D.C. T.M.E.R.&L.Co.</u>
Jan.	84259	115792	66934
Feb.	92454	108826	74750
March	72465	112839	71078
April	87407	104356	69788
May	87083	115359	78263
June	73420	121060	66167
July	68187	124607	65199
Aug.	73002	115656	87991
Sept.	40621	113079	117326
Oct.	74370	122639	108329
Nov.	88161	116989	127843
Dec.	110730	116932	128078
	952159	1388134	1063746

POWER STATISTICS FOR YEAR 1928
Summary Power Purchased

	<u>A.C. Skokie</u>	<u>A.C. W.Harbor</u>	<u>A.C. L.Bluff</u>	<u>A.C. Waukegan</u>	<u>A.C. Wilw.</u>	
Jan.	469394	341034	1245947	1170975	570140	- 3797490
Feb.	460227	331984	1151000	1109648	568690	- 3621549
March	497753	347070	1163947	1115108	562137	- 3686015
April	497583	338016	1089000	1042763	537834	- 3505196
May	477600	313872	1200263	938001	562252	- 3491988
June	485850	256530	1141947	915428	592566	- 3392341
July	507200	327000	1132736	912795	563992	- 3443723
Aug.	608530	297000	1142789	900608	546824	- 3495751
Sept.	556220	309000	1064449	994697	578260	- 3502626
Oct.	565690	330000	1182721	952127	601054	- 3631592
Nov.	548690	357000	1252993	870583	569038	- 3598104
Dec.	539890	375000	1312841	979583	573098	- 3780412
						<u>42946787</u>

	<u>D.C. Calvary</u>	<u>D.C. Hiles</u>	<u>A.C. Hiles</u>	<u>A.C. Cent. St.</u>	<u>D.C. T.N.R.R.&L</u>	
Jan.	139300	114200	84259	115792	66934	- 522465
Feb.	130180	113180	92454	106626	74750	- 519390
March	168940	92090	72465	112839	71076	- 517412
April	141590	106650	87407	104356	69788	- 509791
May	139230	105030	87083	115359	78263	- 524965
June	144670	96000	73430	121060	66167	- 501327
July	136240	100860	68187	124607	65199	- 495093
Aug.	140660	102880	73002	115656	87991	- 520189
Sept.	169070	119316	40621	113079	117326	- 559412
Oct.	113611	93316	74370	122639	108329	- 512265
Nov.	142940	112540	88161	116989	127843	- 588473
Dec.	140420	119680	110730	116932	128078	- 615840
						<u>6386542</u>

Total K.W.H. Purchased A.C. & D.C. 49,333,418

POWER STATISTICS FOR YEAR 1928.
Average Maximum Demand.

	<u>P.S.Co.</u>	<u>Milw.</u>	<u>Total.</u>
Jan.	7981	1500	9481
Feb.	8353	1500	9853
March	7791	1500	9291
April	8084	1500	9584
May	7127	1500	8627
June	6896	1500	8396
July	6763	1500	8263
Aug.	6636	1500	8136
Sept.	7357	1500	8857
Oct.	7776	1500	9276
Nov.	8644	1500	10144
Dec.	8330	1500	9830
	<u>91688</u>	<u>18000</u>	<u>109688</u>

Average Monthly K.W. Maximum Demand for Year 9,140

POWER STATISTICS FOR YEAR 1928
Substation Equipment

<u>Substation</u>	<u>Installed Capacity</u>	<u>No. of Units</u>
Niles Center	2000	1
# 1	1500	1
# 2	1500	1
# 3	1500	1
# 4	1500	1
# 5	1000	2
Liberty Lake	1000	1
Winnetka	1500	1
Ravinia	1000	1
Fort Sheridan	1500	1
Lake Bluff	1000	1
North Chicago	1800	3
Beach	1000	1
Winthrop Harbor	1200	1
McKeown	1000	2
Kenosha	1000	1
Bose	1000	1
Racine	1000	2
Racine Quarry	500	1
4 Mile	500	1
Carrollville	1000	2
College	500	1
Milwaukee	2000	2
	<u>27550</u>	<u>30</u>

Note: All Substations are rotary converter stations except # 5, which is a mercury arc. rectifier station.

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Automatic Crossing Signals.	
Maintained	35
Installed	-
Crossing Enunciator Bells.	
Maintained	9
Installed	2
Crossing Warning Bell Electric.	
Maintained	25
Installed	3
Electric Lighted Crossings.	
Maintained	77
Installed	2
Poles and Fixtures Wood Construction.	
Maintained	76.4 Double Track Miles.
Installed	-
Poles and Fixtures Wood Construction Sidings & Yards.	
Maintained	34.3 Single Track Miles.
Installed	2.11 " " "
Poles and Fixtures Steel Construction.	
Maintained	2.76 Double Track Miles.
Maintained	19.78 Single Track Miles.
Installed	.50 Single Track Miles.
Poles and Fixtures Steel Bridge Construction.	
Maintained	22.1 Double Track Miles.
Installed	-
Feeder Cable Maintained.	
Maintained	156.6 Single Wire Miles.
Installed	1.5 " " "
Trolley Wire Direct Suspension.	
Maintained	205.9 Single Track Miles.
Installed	1.25 " " "
Replaced	30. " " "
Trolley Compound Catenary Contact System.	
Maintained	21.57 Double Track Miles.
Installed	-
Trolley Simple Catenary Contact System.	
Maintained	1.23 Single Track Miles.
Installed	.76 " " "

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Rail Bonding.	
Maintained	251.5 Single Track Miles.
Installed	8.11 " " "
Electric Lighted Passenger Stations.	
Maintained	67
Installed	-
Electric Lighted Freight Stations.	
Maintained	12
Installed	-
Electric Lighted Shelters.	
Maintained	52
Installed	2
Electric Lighted Shops and Car Houses.	
Maintained	3
Installed	-
Electric Lighted Miscellaneous Buildings.	
Maintained	25
Installed	3
Electric Lighted Station Platforms.	
Maintained	186
Installed	3
Electric Lighted Substation Buildings.	
Maintained	23
Installed	-
Electric Lighted Office Buildings.	
Maintained	2
Installed	-
Electric Lighted Freight Yards.	
Maintained	2
Installed	1
Electric Lighted Terminal Yards.	
Maintained	4
Installed	-
Automatic Substations.	
Maintained	19
Installed	-
Manual Substations.	
Maintained	4
Installed	-
Operated	4

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Transmission Lines 60 Cycle 33000 Volt
Maintained 31.9 Miles of Three Wire Lines.
Installed -

Transmission Lines 25 Cycle 33000 Volt.
Maintained 48.1 Miles of Three Wire Line.
Installed -

Transmission Lines 60 Cycle 33000 Volt.
Maintained 12.3 Miles of Two Wire Line.
Installed -

Transmission Lines 60 Cycle 2300 Volt.
Maintained 17.5 Miles of Two Wire Line.
Installed -

Transmission Line 25 Cycle 13200 Volt.
Maintained 2.37 Miles of Three Wire Line.
Installed -

DETAIL OF CONSTRUCTION WORK PERFORMED BY ELECTRICAL
DEPARTMENT DURING THE YEAR 1928.

A.P.E.

- 2549 Installed Automatic Control Equipment in 2nd 500 K.W. Rotary Converter at Carrollville Substation.
- 2529 Finished the construction of Skokie Valley Substations #1-2-3-4 and 5.
- 2632 Purchased outdoor high tension switching equipment from Public Service Company of Northern Illinois located at #2 and #4 Substations on Valley Line.
- 2647 Rebuild catenary contact system on both tracks of Scranton Ave. Curve Lake Bluff.
- 2671 Installed feeder cable, switch house and necessary switches for the purpose of sectionalizing feeder system at No. Chicago Junction.
- 2581 Changed lighting in Highwood Office Building from 110 volt D.C. to 115 volt 60 cycle A.C. Power. This required rewiring distribution boxes so as to properly balance circuits.
- 2662 Installed 35000 volt oil circuit breaker and necessary bus work and switches on the south 22000 volt transmission line at Fort Sheridan Substation.
- 2669 Installed warning bell at Dempster St.
- 2721 Rebuild pole line between 22nd and 18th St. No. Chicago. This was done at request of the City of No. Chicago in order to remove trolley poles from the west side of highway which were interfering with street lighting standards.
- 2727 Installed poles and simple catenary contact system in order to electrify 2200 ft. of Kostner Ave. team track.
- 2773 Installed flood lights to illuminate automobile parking spaces at No. Chicago Junction and Edison Court.
- 2821 Installed flood lights to illuminate freight yards at Rondout.
- 2748 Dismantled electrical equipment in the old 25 cycle Winnetka Substation and retired same from the Capital account.
- 2769 Rebuild overhead over transfer track at Racine with C.M. & St. P. & P. Ry.

DETAIL OF CONSTRUCTION WORK PERFORMED BY ELECTRICAL
DEPARTMENT DURING THE YEAR 1928. (Cont'd)

A.F.E.

2808. Install poles and simple catenary contact system in order to electrify 2200 ft. of Kostner Ave. team track.
- Install poles and direct suspension trolley wire in order to electrify 700 ft. of Lake Ave. Siding.
- Install poles and direct suspension trolley wire in order to electrify 1500 ft. of Willow Road Siding.
- Install poles and direct suspension trolley wire in order to electrify 900 ft. of 16th St. No. Chicago Siding.
- Installed poles and direct suspension trolley wire in order to electrify Siding to Brick Co. at Burlington Road Siding. 2400 ft. of electrification.
- Installed poles and direct suspension trolley wire in order to electrify 2600 ft. track extension on North Ave., Waukegan.