

CHICAGO NORTH SHORE AND MILWAUKEE RAILWAY

ANNUAL REPORT

FOR THE YEAR 1954

WAY, STRUCTURES AND POWER DEPARTMENT

Highwood, Illinois
April 25, 1955

F O R E W O R D

This report is an account of the work accomplished by the Way, Structures and Power Department during the year 1954 and includes all A.F.E. and maintenance work performed by regular company forces as well as information and statistics relating to the maintenance work which is of interest at this time and will be of value in the future for record and reference purposes.

In 1954 only two crossings were protected by the installation of automatic gates and flashing light signals. One crossing was closed during the year by order of the Wisconsin Public Service Commission, namely, 13th Street, Racine.

A reduction of forces was made on June 1, 1954, which curtailed some of the regular maintenance work. There was no ballasting program carried out during the year or rail renewal other than individual replacements where needed. The tie renewal program was again held down to a bare minimum requirement.

The principal electrical work done during the year was the Wisconsin Substation Conversion Program under which substations at McKeon, Racine and Bose Road were placed in operation with 60-cycle power. This eliminated the necessity for the 25-cycle source of power furnished across the State Line by the Commonwealth Edison Company.

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TRACK AND ROADWAY
ADDITIONS AND BETTERMENTS

RETIRE DODGE AVENUE CROSSOVER - A.F.E. 5297

This A.F.E. was issued to record the retirement of the Dodge Avenue crossover. Work was done on September 17, 1953.

SIDETRACK CONSTRUCTION AT BIRCH ROAD - A.F.E. 5296

This authority was issued to cover the Railway's portion of a sidetrack built to serve the Wisconsin Fuel Company and the Andrews Lumber Company located east of the right-of-way and south of Birch Road. Track on Railway property is 128 feet long starting from a No. 6 turnout in the Birch Road siding and extending southeasterly to the right-of-way line. The existing sidetrack was extended 99 feet south.

Track on industries' property is 192 feet long, being 80 feet on Wisconsin Fuel property and 112 feet on Andrews Lumber.

All track except 99-foot sidetrack extension is electrified.

RETIRE GRADE CROSSING AT 13th STREET, RACINE - A.F.E. 5310

In accordance with orders of the Public Service Commission of Wisconsin issued under Docket No. 2-R-2636, the grade crossing at 13th Street, Racine, was closed and barricaded on November 10, 1954. On that date snow fence was stretched across the street on both sides of the right-of-way and the crossing plank and both crosswalks removed. Signal forces removed the manual crossing gates the same day. The gate tower was removed on the following day.

RAIL RENEWAL ON LIBERTYVILLE BRANCH - A.F.E. 5295

495 track feet of 80# rail was relaid with 100# relayer rail on the southbound track west of the bridge over U. S. Route 41. Track was fully tie-plated and equipped with 10 rail anchors per rail.

TRACK AND ROADWAY

JOB ORDERS

WAUKEGAN STEEL SALES CO. TRACK, WAUKEGAN - J.O. 1053

Company forces constructed a 99-foot extension from the end of Braun Brothers siding south on Waukegan Steel Sales Company property. All costs were borne by the Steel Company.

SIDETRACK CONSTRUCTION AT BIRCH ROAD - J.O. 1036 and 1037

Company forces constructed 80 feet of track on the property of the Wisconsin Fuel Company and 112 feet of track on Andrews Lumber Company property east of the right-of-way and south of Birch Road. This track connects with the siding built under A.F.E. 5296. All costs were borne by the industries.

WIDEN 12th STREET CROSSING, RACINE - J.O. 1043

Company forces extended the above crossing 8 feet north using gumwood crossing sections and blacktop in the devil strip. This work was done to meet the new pavement width as constructed by the State and City.

CONSTRUCT CROSSING AT 13th STREET, EAST LINE - J.O. 1033

At the request and expense of Abbott Laboratories, a 28-foot plank and asphalt crossing was installed on the East Line at 13th Street. Grading and paving outside of the track zone was done by the contractor for Abbotts.

TRACK AND ROADWAY

MAINTENANCE WORK

Installed 5,453 - 100# double shoulder tie plates
as follows:

<u>Section</u>	<u>Tie Plates</u>
2 - Glenayre	826
3 - Briergate	1450
4 - South Upton	678
5 - Waukegan	140
6 - Zion	850
8 - South Racine	1004
9 - North Racine	296
10 - Carrollville	93
12 - Milwaukee	116
Total Tie Plates	5453

TIES RENEWED

Ties were renewed by section forces as follows:

<u>Section</u>	<u>Main Line</u>	<u>Sidetrack</u>	<u>Switch</u>
1 - Dempster Street	367	162	81
2 - Glenayre	499	-	-
3 - Briergate	875	-	31
4 - South Upton	758	82	-
5 - Waukegan	304	29	8
6 - Zion	436	-	-
7 - Kenosha	680	-	51
8 - South Racine	888	-	31
9 - North Racine	398	-	106
10 - Carrollville	512	-	61
11 - Grange Avenue	490	-	5
12 - Milwaukee	65	258	-
13 - Libertyville	466	190	-
14 - Winnetka	-	-	6
15 - Highwood	18	47	44
16 - Lake Forest	9	-	2
	6765	768	426

TRACK AND ROADWAY

MAINTENANCE WORK - cont'd.

In addition to the routine work of maintaining the track, cleaning ditches, greasing curves, filling switch lamps and fighting snow, the following work was done by track forces:

Removed the private crossing north of Niles Center Road and closed up the fences.

Both Sections 2 and 3 were expanded to 10-man gangs and equipped with 4-tool pneumatic tie tamping outfits. 12 miles of single track were resurfaced as follows:

Both tracks - Simpson Street to curve south of Winnetka Avenue
S.B. track - South of Sunset Ridge Road to County Line Road
Both tracks - County Line Road to Berkley Road
S.B. track - Deerpath curve

Section 4 surfaced the northbound track from Deerpath Avenue to the north end of the railroad crossing at K.O. Tower, a distance of one mile. A pneumatic tie tamping outfit was used.

The concrete slab crossings at Dundee Road were replaced with plank and asphalt due to deterioration of the slabs.

Unloaded 10 cars of stone ballast on the Skokie Valley Line.

Removed the crossing at 32nd Street, Zion. This work had been ordered by the Illinois Commerce Commission in 1953 but had been held up pending an appeal to the courts.

Crossing frogs at Ryan Tower were repaired twice during the year by the Teleweld Company.

Repaired broken rails and made 11 thermit welds between Harrison Street, Milwaukee, and the viaduct.

Renewed 14 expansion rails, repaired broken rails and made 45 thermit welds on the Sixth Street viaduct.

TRACK AND ROADWAY

MAINTENANCE WORK - cont'd.

Special work at Milwaukee Terminal and the crossings at 6th and National were repaired by the Weimer Welding and Cutting Company.

Rebuilt right-of-way fence on both sides from Garfield Avenue to 600 feet east of Dymond Road.

Due to curtailment of tie and weed cutting programs and reduction of forces on June 1, 1954, all sections except No. 2 and No. 3 spent a great deal of time spot surfacing track with Barco unit tie tampers.

BRIDGE AND BUILDING

ADDITIONS AND BETTERMENTS

VENTILATION WORK - ADAMS & WABASH STATION - A.F.E. 5276

To comply with formal notice from the City of Chicago the existing ventilation system was extended to supply fresh air to the game room in the basement. A 600 C.F.M. duct was run from the front basement to the west wall of the room and 24" x 6" double diffusion grille with filters and access door installed. All work was done by Western Ventilating and Engineering Company.

SIDEWALKS AT CRAWFORD AVENUE - A.F.E. 5304

Company forces constructed concrete sidewalks, 4 feet wide, across the right-of-way on both sides of Crawford Avenue, Skokie. Standard timber crosswalks were built across each track. This work was done at the request of the Village of Skokie and to comply with the terms of the franchise.

PARKING LOT EXTENSIONS - SKOKIE VALLEY LINE - A.F.E. 5274

The parking lot at Northfield was extended south. 3 carloads of cinders were used for fill. This A.F.E. was closed on July 9, 1954 as no further extensions were considered necessary at that time.

PLATFORM EXTENSION AT BRIERGATE - A.F.E. 5306

The northbound platform was extended north 80 feet with standard fill construction in order to permit 6 car trains to clear the Deerfield Road crossing.

FREIGHT OFFICE, KENOSHA STATION - A.F.E. 5307

The space between the ticket office and the vestibule in the northwest corner of the Kenosha passenger station was enclosed with a plywood partition and equipped with shelving and telephones to provide office space for the Wisconsin Freight Agent. The former office in the freight station was vacated and the space rented.

BRIDGE AND BUILDING
ADDITIONS AND BETTERMENTS

PARKING SPACE AT RACINE - A.F.E. 5294

Construction was started on a new parking lot 220' x 20' on the west side of the right-of-way north of Lindermann Avenue. 2 carloads of cinders were unloaded and spread before the project was voluntarily stopped because of protests by residents in the neighborhood. An effort is now being made to have the property rezoned for parking.

CONSTRUCTION OF SHELTER AT HARRISON STREET, MILWAUKEE - A.F.E. 5311

A standard 16-foot, open shelter was built on the southbound platform for the accommodation of passengers. 600 volt lighting was installed.

PLATFORM AND SHELTER RENEWAL, BEECH STREET, HIGHLAND PARK -

The existing 18' x 52' wood platform and "H" type shelter at the north end of the northbound platform were replaced by an 8' x 52' standard fill platform and a standard 16' open shelter moved from Stanley Avenue, North Chicago.

BRIDGE AND BUILDING

MAINTENANCE WORK

BRIDGES, TRESTLES AND CULVERTS

The following repairs were made by company forces:

CANAL BRIDGE

Renewed 100 ties and 4 pieces of guard rail on the southbound track and repaired the catwalk, using 66 pieces of new creosoted pine lumber. Installed 200 new 100# double shoulder tie plates.

Repaired catwalk on northbound track with secondhand lumber.

Applied Libby Zone Process fireproofing to the wood guard rails and ends of ties located below the third rail on both tracks.

OAK CREEK

Renewed 14 ties on the northbound trestle and replaced 2 tower braces between bents 5 and 6 on the southbound trestle.

PUETZ ROAD

Renewed 1 mudsill, 1 pile, 2 braces and 6 ties on the northbound trestle.

Renewed 2 mudsills, 8 piles, 4 braces, 27 stringers, 87 ties and 13 guard rails on the southbound trestle. Installed 180 new 100# double shoulder tie plates.

MAHN OVERWAY

Renewed 4 piles, 3 caps and 2 sway braces. Renewed the north truss with 1 - 12" x 12" x 40' and 2 - 8" x 12" x 20' new creosoted fir timbers. Caps renewed were 12" x 12" x 24' creosoted fir.

GREAT LAKES TRESTLE

Renewed 3 caps and 3 braces.

BRIDGE AND BUILDING

MAINTENANCE WORK

BRIDGES, TRESTLES AND CULVERTS - cont'd.

DES PLAINES RIVER

Renewed 1 mudsill, 5 piles and 3 braces in the southbound trestle.

CULVERTS

Repaired culverts at 33rd Street, Zion; Carrollville section house; Ravinia Park.

BRIDGE AND BUILDING

MAINTENANCE WORK

BUILDINGS AND PLATFORMS

In addition to routine minor repairs to buildings and platforms the following major work was done:

At Howard Street the temperature control system for the heating plant was changed from a single pipe to a two pipe system. Three new thermostats were installed. All work was done by the Powers Regulator Company.

Made and installed storm windows at Dempster station.

Replaced the front porch and patio at Woodridge station. The old floor joists had rotted away, allowing the concrete floor to settle about 6 inches. The old floor was removed, a new concrete block foundation built and filled with pit-run sand and a new concrete floor was laid over the foundation.

Replaced the telephone booth at Northbrook crossover which had been destroyed by fire.

Renewed platform curbs at 14th Street, West Line.

At Racine substation a 2-ply, built-up roof was installed over the south, low, part of the building and the roof over the high part was recoated with a hot application. All work was done by the A-1 Roofing Company.

Replaced the telephone booth at Austin Avenue.

Renewed the wood deck on transfer table at Milwaukee Barn.

Installed a telephone booth and XYZ telephone protection structure at the south end of southbound platform at Harrison Street, Milwaukee.

Winding Roofing Company applied a hot coat of waterproofing asphalt on the station roof, two entry canopies and inside of parapet walls on the Milwaukee Terminal.

Repaired the floor in the Church Street station and straightened up the north end of the northbound canopy.

Replaced about 280 square feet of plank floor in the Armature Room at Highwood Shops with concrete.

BRIDGE AND BUILDING

MAINTENANCE WORK

BUILDINGS AND PLATFORMS - Cont'd.

Repaired all shelters and crosswalks on the Libertyville Branch.

The shelter at Thornbury Village, which was destroyed by fire, was replaced with an "H" type shelter moved from South Kenosha.

Due to reduction of forces on June 1, 1954, the Carpenter Gang was cut to 3 men making it impossible to do anything but the most urgent work.

MACHINE SHOP

In addition to the routine work of maintaining tools and equipment for all divisions of the Department, the following work was done:

Overhauled 9 section gang motor cars and 2 small inspection cars.

Rebuilt 1 Fairmont inspection car.

Rebuilt 6 push cars.

Rebuilt material handling conveyer.

Rebuilt sump pump in Highwood Inspection Shop.

Overhauled 3 air compressors.

Repaired 11 frogs and 25 switch points.

Made 12 gear racks for Model 31 automatic gates.

Maintained and serviced the Highwood boiler.

BRIDGE AND BUILDING

MAINTENANCE WORK

SHEET METAL SHOP

About 50% of the time of this shop is devoted to making water coolers, flush tanks, water supply tanks, card holders, toilet chutes, destination sign box panels, car heater magazines, roof flange, smoke jacks and ventilators for the Mechanical Department.

In addition to the foregoing work for the Mechanical Department and miscellaneous spot maintenance to heating plants and sheet-metal work on buildings, the following was done:

Renewed gutter on west side of Edison Court station building and repaired gutters at 12 locations.

Repaired or replaced 11 smoke pipes and replaced 8 smoke stacks at various locations.

Repaired 75 trainmen's lockers.

Made and installed 3 ventilators on Highwood Car Shops.

Made 8 trash cans and 5 garbage cans.

Repaired 6 headlights, 16 marker lights and 25 switch lamps.

Cleaned all furnaces on the system. Cleaned and adjusted all oil burners.

Made 11 manual control boxes for automatic gates, 18 boxes for the Electrical Department and 6 boxes for the telephone system.

MISCELLANEOUS

Repaired water line at Great Lakes station.

Constructed stone driveway leading to Four-Mile Road substation.

Cleaned the outfall sewer from Lake Bluff subway.

BRIDGE AND BUILDING

MAINTENANCE WORK

MISCELLANEOUS - cont'd.

Made extensive repairs to the planking on the Wheel Track at Highwood Shops.

Delivered storeroom supplies to all points south of Waukegan.

Inspected and serviced all fire extinguishers at stations, towers and section houses.

Replaced the coal fired hot water heater at Milwaukee Terminal with one salvaged from the old apartment building at 5th and Michigan.

Replaced the gas fired hot water heater at Howard Street with a Rheem Model 50 heater.

One pump at Custer Street was removed, overhauled and reinstalled by Yeoman Brothers Pump Company.

Operated the weed killer over the main line and the Libertyville Branch.

BRIDGE AND BUILDING

MAINTENANCE WORK

PAINTING

LOCATION

Wilson Avenue, Chicago	Washed interior of station, barber shop and commissary.
McKeon Substation	Painted all exterior trim.
Kenosha Substation	" " " "
Bose Road Substation	" " " "
Racine Substation	" " " "
Racine Station	Painted toilet rooms and commissary storeroom.
Carrollville Section House	Painted interior.
Milwaukee Terminal	Washed Traffic office.
Church Street, Evanston	Washed interior of station and painted toilet rooms.
Highwood Shops	Painted all exterior trim on Car Barns, Inspection Shop and Storeroom.

Painted steel in Transfer Table at Milwaukee Barn.

Repainted warning signs on bridges in Wisconsin
and all station signs on the Libertyville Branch.

On June 1, 1954, 2 painters were furloughed and
the Painter Foreman reduced to the status of "Sign Painter
and Paper Hanger" on account of reduction in forces.

WAY AND STRUCTURES

EQUIPMENT PURCHASED

PURCHASE OF PORTABLE AIR COMPRESSOR - A.F.E. 5292

Purchased one gasoline driven Worthington 60 cubic foot portable air compressor for the track surfacing work.

PURCHASE OF TRACK MOTOR CAR - A.F.E. 5312

Purchased a Kalamazoo No. 56A motor car equipped with storage battery, generator and electric starter. Retired Buda 119 motor car - Railway No. 17 - which was bought in 1927.

Purchased a Model T.Q. 50 - Type C - Snap-on Torgo meter for use in the Speeder Shop. This instrument measures and regulates the torque applied in tightening bolts when replacing the heads on gasoline engines.

WAY AND STRUCTURES SUMMARY

	<u>1954</u>	<u>1953</u>
<u>TRACK CONSTRUCTION - LINEAL FEET</u>		
Sidetrack Constructed on Railway R/W	227	--
" " " Private Property	291	370
 <u>RAIL INSTALLED -SINGLE TRACK FEET</u>		
115#	--	4,386
100#	495	--
80#	<u>227</u>	<u>--</u>
TOTAL	722	4,386
 <u>RAIL RENEWED IN KIND - SINGLE TRACK FEET</u>		
100#	--	--
80#	<u>--</u>	<u>--</u>
TOTAL	--	--
 <u>RAIL REMOVED - SINGLE TRACK FEET</u>		
100#	--	4,386
80#	495	--
65#	<u>--</u>	<u>--</u>
TOTAL	495	4,386
 <u>TIE PLATES INSTALLED</u>		
100#	5,833	6,707
115#	--	4,639
 <u>ANGLE BARS RENEWED - PAIRS</u>		
100#	--	101

WAY AND STRUCTURES SUMMARY - cont'd.

	<u>1954</u>	<u>1953</u>
<u>SPECIAL WORK</u>		
Crossovers Removed	--	1
Turnouts Installed	1	--
Turnouts Removed	--	--
Crossings Built Up	2	1
Frogs Repaired	11	15
Switch Points Repaired	25	17
Thermit Welds	54	91
 <u>TIES RENEWED</u>		
Main Line	6,765	7,320
Sidetrack	768	487
Switch	426	468
Bridge	207	35
 TOTAL	 8,166	 8,310
 <u>TIES INSTALLED ON NEW WORK</u>		
Sidetrack - New	49	
Switch - "	32	
 <u>BALLAST - CARS</u>		
Stone	10	1
 <u>CROSSINGS</u>		
Asphalt Crossings Rebuilt	--	4
Crossings Removed	2	--
 <u>BRIDGE REPAIRS</u>		
Bridges Repaired	6	7
 <u>PAINTING</u>		
Buildings - Painted and Decorated	11	7

WAY AND STRUCTURES SUMMARY - cont'd.

	<u>1954</u>	<u>1953</u>
<u>FENCING</u>		
Right-of-way fence Rebuilt - Lin. Feet	3,330	3,115
<u>WEED KILLER</u>		
One Application - Single Track Miles	160	--
Total Solution Used - Gallons	50,000	--
<u>CARLOAD MATERIAL</u>		
Sand and Stone	15	9
Coal	7	4
Ties	--	32
Cinders	20	23
Miscellaneous	<u>7</u>	<u>7</u>
TOTAL	49	75

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

ADDITIONS AND BETTERMENTS

CROSSOVER PROTECTION CIRCUITS - A.F.E. 5300

The August 8, 1951 Signal Inspection Report of the Interstate Commerce Commission, Bureau of Safety, gave 22 violations of Section 136.203 - Hand-operated Crossover between Main Tracks, Protection. This includes all crossovers in signal territory not now provided with protection. A program has been started to provide the necessary protection on two of these crossovers each year. This A.F.E. covered the crossover at East Prairie Road and Downey's facing point crossover. To date 6 crossovers have been protected and 1 has been retired, leaving a total of 15 including 4 on the Shore Line.

AUTOMATIC GATES AND FLASHERS AT GOLF ROAD, WAUKEGAN - A.F.E. 5162

Installed two Griswold automatic gates with flashing light signals replacing a track circuit operated autoflag. The southbound cut-out was moved to the south side of the crossing. The Highway Department of Lake County paid 50% of the cost of this installation. Gates were put in service on November 12, 1954.

AUTOMATIC GATES AND FLASHERS AT 50th STREET, KENOSHA - A.F.E. 5156

Installed two Griswold automatic gates with flasher signals and sidewalk arms and two automatic sidewalk gates to replace existing track-box autoflag and two shifts of flagmen. In connection with this installation the Public Service Commission of Wisconsin ordered the installation of series track circuits on the seven Nash switch tracks east of the crossing, to lower the west gate protecting the North Shore main tracks, when the switch tracks across 50th Street were occupied. An agreement was entered into with American Motors Corporation to install and maintain these series track circuits at their expense. This additional work was not completed until after the first of the year (1955) so the gates were not placed in service until January 11, 1955.

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

ADDITIONS AND BETTERMENTS - cont'd.

AUTOMATIC GATES IN RACINE - A.F.E. 5161

Installed two Griswold automatic gates with flashing light signals and sidewalk arms and two automatic sidewalk gates at 14th Street, Racine, replacing manually operated gates. This installation was put in service on July 22, 1954.

On November 10, 1954 the 13th Street crossing was closed and barricaded and the manually operated crossing gates removed.

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

MAINTENANCE WORK

In addition to the routine work of maintaining interlocking plants, block signals and crossing protection devices, the following work was done and charged to maintenance accounts:

At East Prairie Road the northbound cut-out for the automatic gates was moved from east of the crossing to the west side. The northeast gate was replaced and taken to the shop for overhaul.

Renewed track cables to the southbound track cut at Kostner Avenue.

Renewed gate cables and track wires and moved the track cuts to the leaving side of crossing at Simpson Street, Harmswoods.

Renewed upper left hand gate door and swing gear on east gate at Lake Avenue, Skokie Valley Line, after a train-auto collision.

Replaced the underground signal cable from the junction box south of Northfield platform to the relay case north of Willow Road with 500 feet of aerial cable suspended from the catenary bridges on the west side of the track. Cable was run in steel pipe from the junction box east of the track to a new junction box mounted on the west leg of the catenary bridge south of the platform.

At Deerfield Road, Briergate, the Style "M" automatic gate on the southwest corner was replaced and taken to the shop for overhaul. The Style "M" automatic gate on the northeast corner was broken beyond repair and was replaced. Put a third lamp on both gate arms and installed a shunt-type flasher relay.

Repaired signal cable at Northbrook and Briergate where it had been damaged by platform extension work.

Checked polarity of all track cut sections between Howard Street and K. O. Tower, and made necessary corrections.

Replaced track wires and bootlegs at Signal 322.

At South Upton Plant all wires in the trunking were tested and re-tagged. Signal L-54, Relay Case 37 and Relay Case 38 were leveled and plumbed.

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

MAINTENANCE WORK - cont'd.

Renewed low voltage control cable between autoflags at Argonne Drive, North Chicago.

Renewed 110 volt power cable and low voltage control cable to Clarkson Street autoflags.

Replaced the southwest automatic gate at Glen Flora Avenue which had been broken beyond repair. Cables to this gate were renewed. Cable crossing under the track was installed in steel pipe.

The power supply for the 2200 volt signal line through Kenosha was changed from 76th Street to the Power Company's 45th Street substation.

Replaced the Style "M" automatic gate on the northeast corner at Roosevelt Road, Kenosha. The center section was broken beyond repair. Replaced all gate lamps at this crossing with Griswold type lamps and added a third lamp.

Replaced gate lamps at 60th Street, Kenosha, with Griswold type lamps and added a third lamp to each arm. Renewed the battery with a 5-cell DME9A battery in a concrete battery box.

Replaced the southwest automatic gate at 52nd Street, Kenosha. The center section was broken beyond repair.

Renewed gate arm shaft on southwest gate at Birch Road which was bent by the tornado of July 6.

Replaced obsolete "turtle back" switch circuit controllers at 21st Street and 17th Street, Racine, with Union Switch and Signal Company Style U-5 controllers.

Local power for gate operation at 21st, 16th and 15th Streets, Racine, was discontinued on February 2, 1954. Power is now taken from the 2200 volt line.

Renewed gate foundation, left gate arm support, flashing light unit, two gate lamps, traffic arm, sidewalk arm and hold clear coil in southwest Griswold automatic gate at Kinzie Avenue, Racine, following a train-auto collision.

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

MAINTENANCE WORK

All signal wires along the C&NW Ry. tracks at Ryan Tower were removed from the trunking and suspended from messenger wire attached to short poles. Junction boxes were installed at each signal governing C&NW Ry. train movements through the plant. The old trunking was removed.

The junction box on the main signal cable north of Howell Road was raised to get it out of the water. All other junction boxes between Ryan Tower and Austin Avenue were inspected and tested.

The Mechanical Switchman at Oklahoma Avenue was replaced with a factory rebuilt machine.

The power supply for the switch protection signal at Harrison Street, Milwaukee, was changed from 60-cycle, formerly obtained from the Harrison Street station, to the 25-cycle power line.

Renewed the push-button switch at Rondout Scalehouse used for manual control of automatic gates at Knollwood.

Replaced the automatic sidewalk gate on the southbound corner at 4th Street, Libertyville.

Renewed all gate and track cables at Butterfield Road and added a third lamp to each gate arm.

Renewed track wires and bootlegs at northbound start for automatic gates at Highwood Avenue.

During the year 273 relays were repaired in the Highwood Relay Shop.

5 Model M, 1 Model E and 1 Model 31 gates were overhauled in the shop.

45 gate motors were repaired by commercial shops.

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

MAINTENANCE WORK - cont'd.

CROSSING GATES AND SIGNALS MAINTAINED AS OF DEC. 31

	<u>1954</u>	<u>1953</u>
Automatic Gates	39	39
Automatic Gates and Flashers	41	39
Manual Gates	5	7
Flasher Signals	5	5
Autoflags - Track Circuit	14	15
Autoflags - Manual Control	3	3
Block Signals - S.T. Miles	112.6	112.6
Switch Protection Signals	8	8
Interlocking Plants	4	4
Smash Gates	3	3
Gate Indication Signals	14	14

COMMUNICATION AND SIGNALS DIVISION

SIGNAL AND INTERLOCKING

CROSSING GATE OPERATION

Automatic Gate Locations

	<u>1954</u>	<u>1953</u>
Gates broken by automobiles	99	100
Other interruptions*	360	280

Manually Operated Crossing Gate Locations

Gates broken by automobiles	9	12
Other interruptions*	9	29

*Includes interruptions due to power failures, blown fuses, mechanical failures, frosted contacts, line trouble, track circuit trouble, sleet, pedestrians breaking sidewalk arms, etc.

COMMUNICATION AND SIGNALS DIVISION

ADDITIONS AND BETTERMENTS

TELEPHONES

RENEW TELEPHONE CABLE - A.F.E. 5299

This A.F.E. was issued to cover the cost of renewing the main trunk line telephone cable between Highwood Office and Bloom Street, Highland Park. At the end of the year the messenger wire had been renewed and new terminal boxes installed at either end.

TELEPHONE FACILITIES

	<u>1954</u>	<u>1953</u>
Aerial Cable - Miles	12.14	12.14
Underground Cable - Miles	26.68	26.68
2-Wire Open Line	143.64	143.64
Cable Terminals - All Classes	121	121
XYZ Cable Terminal Protections	21	21
Cable Houses	37	37
Telephone Booths	64	58
Telephone Boxes on Poles	7	7
Telephone Stations	187	204
Interlocking Plant Telephones	16	16
Dispatch Boards - 20 Line	1	1

DISTRIBUTION AND POWER DIVISION

ADDITIONS AND BETTERMENTS

SIDETRACK CONSTRUCTION AT BIRCH ROAD - A.F.E. 5296

Electrified 320 feet of new sidetrack built to serve the Andrews Lumber Company and the Wisconsin Fuel Company.

RAIL RENEWAL ON LIBERTYVILLE BRANCH - A.F.E. 5295

Installed rail bonds on 495 track feet of 100# relayer rail relaid on the southbound track west of the bridge over U.S. Route 41.

DISTRIBUTION AND POWER DIVISION

ADDITIONS AND BETTERMENTS - cont'd.

CONVERSION TO 60-CYCLE POWER IN WISCONSIN

The program for conversion of the Wisconsin Substations to operate on 60-cycle power was carried forward during 1954 to the end that three substations were changed over and operated on 60-cycle energy on the following dates:

McKeon Road	June 28, 1954
Racine (Taylor Avenue)	December 3, 1954
Bose Road	December 30, 1954

The original plan was modified to substitute Bose Road for College Avenue after lightning got into the station on June 14, 1954, and damaged the 25-cycle rotary to the extent that the armature would have to be rewound. Another factor influencing the substitutions was the cost of getting a 60-cycle transmission line into the College Avenue Substation, which was estimated to be \$25,000. A supplemental agreement was entered into with the Commonwealth Edison Company to cover this change.

At the end of the year authority was obtained to convert the Four-Mile Road Substation to 60-cycle power in 1955. The Wisconsin Public Service Commission ordered the Wisconsin Electric Power Company to continue furnishing our requirements for 25-cycle power until January 1, 1958.

Work done in 1954 is described below:

McKeon Road - A.F.E. 5271

McKeon Road Substation was placed in operation as a 60-cycle, 1500 KW automatic substation on June 28, 1954. 60-cycle power is supplied from Kenosha Substation over the existing 60-cycle transmission line. At the end of the year the No. 1 - 25-cycle rotary, transformers and control equipment were yet to be removed.

Racine Substation - A.F.E. 5278

Racine Substation was placed in operation as a 60-cycle, 1000 KW automatic substation on December 3, 1954. The station was ready some months previous but conversion was delayed on account of negotiations for a 60-cycle power supply from the Wisconsin Electric Power Company. This power supply was finally secured and the service connection installed just

DISTRIBUTION AND POWER DIVISION

ADDITIONS AND BETTERMENTS - cont'd.

CONVERSION TO 60-CYCLE POWER IN WISCONSIN - cont'd.

north of the substation building, with connections to the Wisconsin Electric Power Company's two 26.4 k.v. circuits on the wood pole transmission tie line between Racine and Kenosha, which is located on Railway right-of-way under a 1917 agreement.

At the end of the year the No. 1 - 25-cycle rotary, transformers and control equipment were yet to be removed.

Bose Road Substation - A.F.E. 5279

After the substitution of Bose Road for College Avenue was agreed to, this station was converted to a 60-cycle, 1000 KW automatic substation and placed in operation on December 30, 1954.

The rotary scheduled for College Avenue was used at Bose Road. The power transformer came from the old Lanyon Street Substation in North Chicago after being adapted for 60-cycle use. The existing 25-cycle control transformer at Bose was rewound by the Westinghouse Company for use on 60-cycle power. Where relays or contactors on the automatic control equipment would not work on 60-cycle power, new coils were wound or new 60-cycle equipment purchased.

At the end of the year all that remained to be done at Bose Road was cleaning up.

Transmission Line Removal

In accordance with Commonwealth Edison Company agreement, the existing 60-cycle transmission line between Winthrop Harbor Substation and the Illinois-Wisconsin State Line was removed completely, including wires, insulators, cross arms and Bates poles where they did not carry the trolley system cross spans.

Four-Mile Road Substation - A.F.E. 5313

No work was done at this location in 1954.

DISTRIBUTION AND POWER DIVISION

MAINTENANCE

In addition to the routine work of this division, the following major items of maintenance work were done.

Renewed 97 wood poles, 261 - 45,000 volt transmission line insulators, 218 anchors, 267 back guys and 267 cross spans.

Renewed 10,718.4 feet of 4/0 trolley wire and repaired 6 wire breaks.

Renewed 567 - 400,000 c.m. rail bonds.

At Mechanical Department Highwood Shop, rearranged 3-phase service and changed motor generator set from 600 volt D.C. to 3-phase, 220 volt system.

At Harrison Street Substation, the current transformer on the south line which was damaged by lightning, was replaced with one taken from the 25-cycle equipment from McKeon Substation.

At Nechuta Substation, the feeder breaker, which was damaged by lightning, was repaired by the General Electric Company.

Removed 60-cycle transmission line from Winthrop Harbor Substation to State Line for the Public Service Company.

One 1000 k.w. machine was taken out of service at Ravinia Substation and moved to Bose Road Substation.

Changed signal line from Birch Road to Bose Road from 110 volts to 2300 volts.

Moved our wires in the clear at the 6th Street viaduct, Milwaukee, for viaduct widening.

At McKeon Road Substation, removed 1 - 500 k.w., 25-cycle manual machine, and installed 1 - 1500 k.w., 60-cycle automatic machine.

At Bose Road Substation, removed 1 - 1000 k.w., 25-cycle automatic machine and installed 1 - 1000 k.w., 60-cycle automatic machine.

At Racine Substation, removed 1 - 500 k.w., 25-cycle manual machine and installed 1 - 1000 k.w., 60-cycle automatic machine.

DISTRIBUTION AND POWER DIVISION

MAINTENANCE - cont'd.

Cut trolley feeder and telephone wires at American Motors Corporation and assisted in installing overhead conveyor housing.

Cut trolley wires and assisted in moving 2 houses across the tracks during the year.

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR 1954

POWER DISTRIBUTION

	1954	1953	% Inc. or Dec.	
Wisconsin .. exclusive of Milwaukee City	K.W.H.	7,363,105	7,674,372	4.1
Milwaukee City	K.W.H.	26,137	21,284	22.8
Wisconsin.. including Milwaukee City	K.W.H.	7,389,242	7,695,656	4.0
Milwaukee D.C. furnished by W.E.P. Co.	K.W.H.	1,558,625	1,657,375	6.0
Wisconsin D.C. furnished by Winthrop Harbor	K.W.H.	318,766	312,634	2.0
Wisconsin Total	K.W.H.	9,266,633	9,665,665	4.1
Illinois - Public Service Co. & C.T.A.	K.W.H.	22,025,809	21,284,403	3.5
Total Purchased	K.W.H.	31,292,442	30,950,068	1.1
Total Used by Freight Locomotives	K.W.H.	1,439,681	1,720,608	16.3
Used by C.T.A. Skokie Shops	K.W.H.	1,186,862	910,870	30.3
Total Interurban Use	K.W.H.	28,565,899	28,318,590	1.2
Milwaukee City	K.W.H.	1,576,784	1,672,405	5.7
Average Monthly Demand for Year as Billed	K.W.	9,602.4	9,340	2.8
A.C.&D.C. K.W.H. Purchased on Demand				
Charge Basis		29,235,128	29,095,147	0.5
Load Factor for Year		34.77%	35.6%	2.3
Car Miles Operated on North Shore Power, including C.T.A. on Skokie Division		5,785,460.50	5,953,782	2.8
Car Miles Freight		792,680.68	899,708	11.9
Car Miles Other Interurban		4,992,779.82	5,053,984	1.2
Kilowatt Hours per Car Miles Less Freight and Skokie Shops		5.74	5.60	2.5
Average Mean Temperature for Year		52.9	53.1	0.4
Normal Mean Temperature for Year		49.7	50.1	0.8

DISTRIBUTION AND POWER DIVISION

COST OF ELECTRICAL ENERGY PER CAR MILE

K.W.H. - C.N.S.&M. RY.

	<u>Total K.W.H.*</u>	<u>Car Miles on N.S. Power</u>
Jan.	3,037,412	488,844.69
Feb.	2,577,760	446,429.59
Mar.	2,887,419	485,847.07
Apr.	2,530,123	467,439.93
May	2,503,160	475,303.21
June	2,271,003	465,536.80
July	2,308,970	473,802.67
Aug.	2,377,583	491,169.06
Sept.	2,359,750	474,548.87
Oct.	2,610,932	491,382.95
Nov.	2,742,491	498,326.70
Dec.	<u>3,085,839</u>	<u>526,828.96</u>
Total	31,292,442	5,785,460.50

Purchased Power - Account 59 \$518,140.82

Operating Expense - Power Accounts \$603,647.82

Operating Expense \$ 85,507.00

Total Car Miles on North Shore Power 5,785,460.50

Unit Power Cost: 1.656¢ / KWH

Unit Power Consumption: 5.409 K.W.H. / car mile

Unit Car Mile Power Cost: 8.956¢ / car mile

Unit Total Power Accounts Expense: 10.434¢ / car mile

*Includes Consumption at C.T.A. Skokie Shops

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

LOCOMOTIVE METERED K.W.H.

<u>Engine No.</u>	<u>K.W.H. Used</u>	<u>Mileage</u>	<u>K.W.H. per Mile</u>
452	96,000	9,795	9.80
453	108,020	9,050	11.94
454	101,770	8,526	11.94
455	269,680	14,511	18.58
456	285,320	13,699	20.83
457	174,441	10,595	16.46
458	98,000	8,575	11.43
459	<u>306,450</u>	<u>24,513</u>	<u>12.50</u>
	1,439,681	99,264	14.50

Total Metered at Locomotive - 1,439,681

Power used by locomotives - 1,439,681 K.W.H.
Illinois Part 79.6% 1,145,986
Plus 10% Distribution Loss 114,599

D.C. K.W.H. used in Illinois at
point of delivery 1,260,585 K.W.H.
Wisconsin Part 20.4% 293,695
Plus 25% Transmission & Conversion
Loss 73,424

A.C. K.W.H. used in Wisconsin at point
of delivery 367,119 K.W.H.

Total Energy at Power Co. Metering
Points 1,627,704 K.W.H.

K.W.H. Illinois Part - 1,260,585 @ 1.8854¢ \$23,767.07
K.W.H. Wisconsin Part - 367,119 @ 1.4055¢ 5,159.86

Total Cost for Electric Energy \$28,926.93

Total Freight Car Miles Operated 792,680.68

A.C.&D.C. at point of delivery per freight
car mile 2.05 K.W.H.
Purchased power cost per freight car mile 3.65¢
Total Net Freight Ton Miles 17,532,669
Total K.W.H. per Net Freight Ton Mile 0.0928

POWER PURCHASED - 1954

	<u>1954</u>			<u>1953</u>			<u>Percent</u>		
	<u>Amount</u>	<u>Average Rate</u>	<u>Cost</u>	<u>Amount</u>	<u>Average Rate</u>	<u>Cost</u>	<u>Inc. or Dec. Amt.</u>	<u>Rate</u>	<u>Cost</u>
<u>Public Service D.C. Contract</u>									
Demand as Run	92,599	---	---	88,086	---	---	5.1	---	---
Billing Demand	92,599	\$2.074	\$192,048.25	88,086	\$2.091	\$184,150.50	5.1	0.8	4.3
Energy - K.W.H.	21,845,886	1.006¢	219,845.90	* 21,399,491	0.996¢	213,079.10	2.1	1.0	3.2
Total and Average	---	1.885¢	\$411,894.15	---	1.856¢	\$397,229.60	---	1.6	3.7
<u>Public Service A.C. Contract</u>									
Demand as Run	3,791	---	---	5,917	---	---	35.9	---	---
Billing Demand	** 3,912	\$1.471	\$ 5,754.00	** 5,993	\$1.500	\$ 8,989.50	34.7	1.9	36.0
Energy - K.W.H.	667,272	0.750¢	5,005.21	* 1,476,156	0.738¢	10,894.82	54.8	1.6	54.1
Total and Average	---	1.612¢	\$ 10,759.21	---	1.347¢	\$ 19,884.32	---	19.7	45.9
<u>Wisconsin Electric Power Company</u>									
Demand as Run	17,334.2	---	---	15,988.3	---	---	8.4	---	---
Billing Demand	*** 18,718.1	\$1.214	\$ 22,718.06	*** 18,000	\$1.222	\$ 21,999.96	4.0	0.7	3.3
Energy - K.W.H.	6,721,970	1.047¢	70,380.86	6,219,500	1.098¢	68,313.95	8.1	4.6	3.0
Total and Average	---	1.385¢	\$ 93,098.92	---	1.452¢	\$ 90,313.91	---	4.6	3.1
<u>W.E.P. Co. Metered D.C.</u>	1,558,625	1.200¢	\$ 18,703.50	1,657,375	1.200¢	\$ 19,888.50	6.0	---	6.0
<u>C.T.A. Calvary D.C. (A)</u>	498,689	1.595¢	\$ 7,951.78	197,546	1.568¢	\$ 3,097.86	152.4	1.7	156.7
<u>GRAND TOTAL -</u>									
Demand - A.C. & D.C.	115,229.1	\$1.913	\$220,520.31	112,079	\$1.920	\$215,139.96	2.8	0.4	2.5
Energy - A.C. & D.C.	31,292,442	1.029¢	321,887.25	30,950,068	1.019¢	315,274.23	1.1	1.0	2.1
Cost	---	1.733¢	\$542,407.56	---	1.714¢	\$530,414.19	---	1.1	2.3

STATISTICS

	<u>Public Service D.C.</u>		<u>Public Service A.C.</u>		<u>Wisconsin Electric Power Co. A.C.</u>	
	<u>1954</u>	<u>1953</u>	<u>1954</u>	<u>1953</u>	<u>1954</u>	<u>1953</u>
Coal Cost per Ton - Mo. Avg.	---	---	---	---	\$7.26	\$7.73
Fuel Cost per Therm - Mo. Avg.	2.74045¢	2.69000¢	2.74045¢	2.69000¢	---	---
Adjustment per K.W.H.	0.15¢	0.15¢	0.15¢	0.15¢	0.35¢	0.40¢
Load Factor as Run	32.3%	33.3%	18.3%	34.2%	53.4%	53.1%
High Monthly Demand	Month KW	Month K.W.	Month K.W.	Month K.W.	Month K.W.	Month K.W.
Low Monthly Demand	Mar 8,500	Mar 8,042	Feb 523	Jan 997	Dec 1,802.3	Mar 1,466.6
Average Monthly Demand	Aug 6,630	Aug 6,280	Dec 127	Sept 313	Feb 1,186.3	June 1,106.2
	7,716.6	7,341	***- 315.9	- 493	- 1,444.5	- 1,332.4

*30% Load Factor **70% Demand, Waived July 1, 1955 ***Minimum Demand ****No P.S. Co. A.C. used in Sept. 1954

(A) 498,689 K.W.H. Supplied by Calvary - 1,186,862.25 K.W.H. Used at Skokie Shops

DISTRIBUTION AND POWER DIVISION

POWER SUMMARY AS BILLED - YEAR 1954

1,735,348	No. 30 Skokie	D.C.
1,040,428	No. 31 Lake Avenue	D.C.
854,274	No. 32 Kotz Road	D.C.
130,330	No. 32 Signals	A.C.
1,158,588	No. 33 Deerfield Rd.	D.C.
774,132	No. 34 Old Mill Rd.	D.C.
149,760	No. 34 Signals	A.C.
396,247	No. 35 Laurel Avenue	D.C.
1,222,890	No. 36 Libertyville	D.C.
419,070	No. 37 Central St.	D.C.
1,863,300	No. 38 Winnetka	D.C.
1,670,380	No. 39 Ravinia	D.C.
1,426,033	No. 40 Ft. Sheridan	D.C.
2,175,680	No. A24 North Chicago	D.C.
986,390	No. 43 Waukegan, Pine St.	D.C.
208,266	No. 44 Beach Rd.	D.C.
956,300	No. 45 Winthrop Harbor	D.C.
3,495,350	No. 80 Lake Bluff	D.C.
315,200	Highwood Shops	A.C.
581,790	Skokie Shops	A.C.
45,800	Glencoe Signals	A.C.
49,200	Kenilworth Signals	A.C.
89,530	Howard St. Station	A.C.
76,400	Waukegan Signals	A.C.
25,200	Zion Signals	A.C.
21,845,886	Public Service Co. D.C. Contract Billings	
498,689	C.T.A. Calvary Billings	D.C.
22,344,575	Total Purchased - Illinois	D.C.
318,766	Less Winthrop Harbor to Wisconsin	D.C.
22,025,809	Total - Illinois	D.C.
667,272	Public Service Co. Billings	A.C.
22,693,081	Total - Illinois	A.C. & D.C.
6,721,970	Wisconsin Electric Power Co.	A.C.
1,558,625	Wisconsin Electric Power Co.	D.C.
318,766	Winthrop Harbor to Wisconsin	D.C.
31,292,442	Total A.C. & D.C. Purchased	
=====		
541,400	McKeon Substation	D.C.
882,650	Kenosha Substation	D.C.
264,030	Bose Rd. Substation	D.C.
794,070	Racine Substation	D.C.
59,500	Quarry Substation	D.C.
374,163	Four Mile Rd. Substation	D.C.
597,400	Nechuta Substation	D.C.
509,800	Carrollville Substation	D.C.
476,500	College Ave. Substation	D.C.
643,100	Milwaukee Substation	D.C.
5,141,953	Total Converted in Wisconsin	D.C.
1,558,625	Wisconsin Electric Power Co.	D.C.
318,766	Winthrop Harbor to Wisconsin	D.C.
7,019,344	Total - Wisconsin	D.C.
7,389,242	K.W.H. Wisconsin	A.C.
26,137	Less Milwaukee City	A.C.
7,363,105	K.W.H. A.C. to Wisconsin exclusive of Milwaukee City	
318,766	K.W.H. D.C. to Wisconsin from Winthrop Harbor	
7,681,871	K.W.H. to Wisconsin exclusive of Milwaukee City	

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

ENERGY PURCHASED

	Public Service Company			Wisconsin Electric Power Co.		
	C.T.A.			C.T.A.		
	<u>D.C.</u>	<u>A.C.</u>	<u>D.C.</u>	<u>A.C.</u>	<u>D.C.</u>	
Jan.	2,115,586	117,680	46,681	564,590	192,875	
Feb.	1,822,977	105,920	46,516	461,472	140,875	
Mar.	2,042,444	124,480	56,082	504,288	160,125	
Apr.	1,785,561	95,600	45,199	468,888	134,875	
May	1,742,781	108,400	34,597	494,382	123,000	
June	1,586,257	85,752	31,314	469,180	98,500	
July	1,609,616	12,640	26,747	562,342	97,625	
Aug.	1,623,838	6,640	31,237	612,118	103,750	
Sept.	1,623,031	-	36,056	603,788	96,875	
Oct.	1,820,291	5,120	39,137	634,384	112,000	
Nov.	1,913,651	2,160	44,609	645,446	136,625	
Dec.	2,159,853	2,880	60,514	701,092	161,500	
	21,845,886	667,272	498,689	6,721,970	1,558,625	

Grand Total - System K.W.H. A.C. & D.C.
 Energy Purchased on Demand - A.C. & D.C. K.W.H.
 Average System Demand for the Year - K.W.
 System Load Factor

DISTRIBUTION AND POWER DIVISION
POWER STATISTICS FOR YEAR - 1954
MILWAUKEE CITY POWER STATISTICS

Kilowatt Hours - D.C.

	<u>N.S. Feeder</u>	<u>W.E.P. Co.</u>	<u>Total</u>
Jan.	5,070	192,875	197,945
Feb.	440	140,875	141,315
Mar.	2,880	160,125	163,005
Apr.	900	134,875	135,775
May	470	123,000	123,470
June	159	98,500	98,659
July	170	97,625	97,795
Aug.	2,840	103,750	106,590
Sept.	660	96,875	97,535
Oct.	1,300	112,000	113,300
Nov.	1,910	136,625	138,535
Dec.	1,360	161,500	162,860
Total	18,159	1,558,625	1,576,784

Kilowatt Hours - A.C.

Jan.	7,310
Feb.	643
Mar.	4,177
Apr.	1,267
May	687
June	220
July	246
Aug.	4,075
Sept.	894
Oct.	1,898
Nov.	2,709
Dec.	2,011
Total	26,137

Total D.C. K.W.H. to Milwaukee City - 1,576,784
 Total A.C. K.W.H. to Milwaukee City - 26,137
 Wisconsin Ratio of Conversion - 69.5%

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

ILLINOIS SUBSTATIONS D.C. OUTPUT IN K.W.H.

	<u>Calvary Sub.</u>	<u>Skokie No. 30</u>	<u>Lake Ave. No. 31</u>	<u>Kotz Rd. No. 32</u>	<u>Deerfield Road No. 33</u>
Jan.	46,681	174,449	101,178	76,090	113,069
Feb.	46,516	142,619	84,228	69,006	102,779
Mar.	56,082	173,839	88,918	74,590	130,719
Apr.	45,199	118,109	85,368	67,990	91,599
May	34,597	144,179	82,418	68,590	94,869
June	31,314	128,839	75,448	52,490	74,749
July	26,747	130,079	71,746	67,265	99,339
Aug.	31,237	133,889	69,412	77,413	92,349
Sept.	36,056	121,819	79,058	72,190	90,279
Oct.	39,137	141,919	90,938	76,890	82,029
Nov.	44,609	154,189	94,938	72,270	81,429
Dec.	60,514	171,419	116,778	79,490	105,379
	498,689	1,735,348	1,040,428	854,274	1,158,588

	<u>Old Mill Rd. No. 34</u>	<u>Laurel Ave. No. 35</u>	<u>Lbtyville No. 36</u>	<u>Central St. No. 37</u>	<u>Winnetka No. 38</u>
Jan.	69,190	29,979	135,769	39,610	167,602
Feb.	59,490	30,608	113,209	28,640	146,818
Mar.	54,090	39,418	131,619	29,190	154,518
Apr.	62,290	33,648	95,169	26,100	150,118
May	55,490	34,108	89,639	31,750	156,618
June	59,390	30,378	76,959	36,090	141,518
July	57,742	34,928	64,919	35,950	144,918
Aug.	58,690	32,508	75,729	33,900	144,418
Sept.	57,790	30,468	76,209	37,040	150,718
Oct.	73,490	34,928	96,959	38,710	159,218
Nov.	79,290	37,488	120,429	37,600	164,018
Dec.	87,190	27,788	146,281	44,490	182,818
	774,132	396,247	1,222,890	419,070	1,863,300

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

ILLINOIS SUBSTATIONS D.C. OUTPUT IN K.W.H. - cont'd.

	<u>Ravinia</u> <u>No. 39</u>	<u>Ft. Sheridan</u> <u>No. 40</u>	<u>No. Chicago</u> <u>A-24</u>	<u>Waukegan</u> <u>No. 43</u>
Jan.	164,490	138,790	211,250	101,020
Feb.	152,390	120,890	181,890	79,630
Mar.	185,790	128,543	195,240	92,490
Apr.	153,490	109,290	167,580	87,960
May	124,490	115,890	172,850	79,970
June	120,890	102,990	152,060	71,940
July	125,490	100,290	149,200	70,920
Aug.	123,390	102,890	159,200	78,890
Sept.	124,590	105,090	163,220	78,250
Oct.	128,490	120,990	187,300	75,910
Nov.	126,990	129,290	204,120	83,380
Dec.	139,890	151,090	231,770	86,030
	1,670,380	1,426,033	2,175,680	986,390

	<u>Beach Rd.</u> <u>No. 44</u>	<u>W. Harbor</u> <u>No. 45</u>	<u>Lake Bluff</u> <u>No. 80</u>
Jan.	20,260	107,000	313,250
Feb.	22,590	84,800	278,040
Mar.	19,300	97,300	308,750
Apr.	9,330	102,900	306,610
May	19,640	79,200	287,130
June	9,786	78,800	276,480
July	16,810	73,900	275,630
Aug.	9,850	57,300	271,620
Sept.	8,650	43,200	274,390
Oct.	21,220	65,200	296,120
Nov.	21,300	81,400	293,560
Dec.	29,530	85,300	313,770
	208,266	956,300	3,495,350

Illinois K.W.H. D.C. - Less Auxiliary Load - 20,881,365

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

AUXILIARY POWER FURNISHED UNDER
D.C. POWER CONTRACT IN K.W.H.

	<u>Kotz Road Signals No. 32</u>	<u>Old Mill Road Signals No. 34</u>	<u>Highwood Shops</u>	<u>Skokie Shops</u>
Jan.	13,010	13,010	32,410	65,930
Feb.	10,830	11,440	27,050	52,570
Mar.	11,490	11,700	30,290	59,480
Apr.	10,530	11,990	27,040	45,010
May	10,110	11,960	25,050	35,630
June	9,270	11,040	22,070	33,260
July	9,640	12,550	19,070	27,280
Aug.	9,890	11,700	21,270	37,440
Sept.	10,020	12,340	23,530	42,240
Oct.	11,200	13,610	27,130	53,550
Nov.	11,320	14,040	26,000	56,740
Dec.	<u>13,020</u>	<u>14,380</u>	<u>34,290</u>	<u>72,660</u>
	130,330	149,760	315,200	581,790

	<u>Glencoe Signals</u>	<u>Kenilworth Signals</u>	<u>Howard St. Station</u>	<u>Zion Signals</u>	<u>Waukegan Signals</u>
Jan.	4,600	5,000	9,130	2,400	7,100
Feb.	4,000	4,200	7,060	2,100	6,100
Mar.	4,200	4,400	7,510	2,160	6,900
Apr.	3,600	4,000	7,660	1,980	6,200
May	3,400	3,600	6,980	2,220	7,000
June	3,400	3,300	6,830	1,980	6,300
July	3,200	3,000	6,870	1,980	6,900
Aug.	3,200	3,700	6,870	1,920	6,400
Sept.	3,400	4,000	6,960	1,980	5,600
Oct.	4,200	4,600	7,750	2,040	5,900
Nov.	4,200	4,500	7,420	2,040	5,700
Dec.	<u>4,400</u>	<u>4,900</u>	<u>8,490</u>	<u>2,400</u>	<u>6,300</u>
	45,800	49,200	89,530	25,200	76,400

Total Auxiliary A.C. under D.C. Contract - 1,463,210 K.W.H.

DISTRIBUTION AND POWER DIVISION**POWER STATISTICS FOR YEAR - 1954****WISCONSIN SUBSTATION D.C. OUTPUT IN K.W.H.**

	<u>McKeon</u>	<u>Kenosha</u>	<u>Bose Rd.</u>	<u>Racine</u>	<u>Quarry</u>	<u>4-Mile Road</u>
Jan.	31,700	81,270	52,060	64,600	4,300	28,500
Feb.	24,200	65,290	49,630	50,700	4,700	26,980
Mar.	29,600	63,880	52,130	58,600	6,200	26,440
Apr.	20,600	70,790	41,750	52,300	4,800	25,350
May	32,400	69,080	42,900	56,400	2,100	25,870
June	27,240	77,460	19,970	58,600	3,000	27,400
July	38,570	71,940	-	74,600	3,400	29,600
Aug.	62,720	77,300	-	74,300	3,500	27,623
Sept.	67,500	76,110	-	71,500	2,500	40,500
Oct.	62,170	81,070	-	77,500	4,600	37,700
Nov.	70,910	74,420	-	74,500	14,800	38,400
Dec.	<u>73,790</u>	<u>74,040</u>	<u>5,590</u>	<u>79,810</u>	<u>5,600</u>	<u>39,800</u>
	541,400	882,650	264,030	793,410	59,500	374,163

	<u>Nechuta</u>	<u>Carrollville</u>	<u>College</u>	<u>Milwaukee</u>	<u>D.C. W.E.P.Co.</u>	<u>Win. Harbor to Wis.</u>
Jan.	48,300	45,000	44,400	73,100	192,875	35,667
Feb.	45,100	37,700	33,300	50,400	140,875	28,267
Mar.	47,100	45,800	43,000	60,800	160,125	32,433
Apr.	56,300	43,100	29,600	56,400	134,875	34,300
May	57,100	43,400	32,900	57,200	123,000	26,400
June	48,900	34,000	41,600	44,300	98,500	26,267
July	53,700	37,300	43,700	44,200	97,625	24,633
Aug.	57,200	34,100	44,700	49,800	103,750	19,100
Sept.	45,600	46,000	51,300	44,400	96,875	14,400
Oct.	47,600	46,600	30,400	50,400	112,000	21,733
Nov.	43,500	46,400	41,200	52,400	136,625	27,133
Dec.	<u>47,000</u>	<u>50,400</u>	<u>40,400</u>	<u>59,700</u>	<u>161,500</u>	<u>28,433</u>
	597,400	509,800	476,500	643,100	1,553,625	318,766

Total Conversion in Wisconsin = 5,141,953
 W.E.P. Co. D.C. " " = 1,553,625
 Win. Harbor D.C. " " = 318,766

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

A.C. POWER FURNISHED IN WISCONSIN IN K.W.H.

	<u>Beach</u>	<u>Kenosha</u>	<u>Racine</u>	<u>Nechuta</u>	<u>Milwaukee</u>
Jan.	117,680	116,160		63,600	384,830
Feb.	105,920	95,040		58,800	307,632
Mar.	124,480	93,120		57,600	353,568
Apr.	95,600	92,160		68,400	308,328
May	108,400	102,048		72,000	320,334
June	85,752	109,440		56,400	303,340
July	12,640	167,040		63,600	331,702
Aug.	6,640	211,200		72,000	328,918
Sept.	-	208,320		56,400	339,068
Oct.	5,120	213,120		61,200	360,064
Nov.	2,160	202,560		50,400	392,486
Dec.	2,880	223,680	110,400	58,800	308,212
	667,272	1,833,888	110,400	739,200	4,038,482

Total AC to Wisconsin
Total Converted in Wisconsin
Efficiency - Wisconsin

7,389,242 K.W.H.
5,141,953 K.W.H.
69.6%

Total AC for Nechuta
Total DC Converted - Nechuta
Efficiency - Nechuta

739,200 K.W.H.
597,400 K.W.H.
80.8%

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

MONTHLY K.W. DEMAND - ILLINOIS STATIONS

	<u>Power #30</u>	<u>Power #31</u>	<u>Power #32</u>	<u>Signals #32</u>	<u>Power #33</u>	<u>Power #34</u>
Jan.	616.7	433.3	516.7	21.0	486.7	473.3
Feb.	596.7	423.3	501.0	18.3	466.7	480.0
Mar.	646.7	486.7	586.7	17.3	583.3	503.3
Apr.	623.4	553.3	516.7	14.3	486.7	450.0
May	610.0	440.0	493.3	15.3	446.7	340.0
June	544.0	380.0	464.0	15.3	486.7	396.7
July	603.0	390.0	512.0	12.3	553.3	406.6
Aug.	560.0	313.3	515.0	13.3	473.3	390.0
Sept.	550.0	416.7	506.7	16.0	503.3	453.3
Oct.	693.3	523.3	616.7	16.0	546.7	560.0
Nov.	686.7	510.0	560.7	17.7	520.0	583.3
Dec.	656.7	610.0	566.7	19.0	520.0	626.7
	7,387.2	5,479.9	6,356.2	195.8	6,073.4	5,663.2

	<u>Signals #34</u>	<u>Power #35</u>	<u>Lbtyville #36</u>	<u>Central Street #37</u>	<u>Winnetka #38</u>	<u>Ravinia #39</u>
Jan.	20.3	186.7	510.0	183.3	740.0	583.3
Feb.	18.3	253.3	453.3	176.7	700.0	560.0
Mar.	14.3	386.7	536.7	173.3	696.7	580.0
Apr.	18.0	300.0	470.0	180.0	670.0	586.7
May	18.0	293.3	446.6	183.3	730.0	533.3
June	17.0	250.0	405.0	186.7	710.0	533.7
July	11.0	270.0	420.0	143.3	670.0	470.0
Aug.	15.0	260.0	403.3	143.3	630.0	463.3
Sept.	22.3	276.7	450.0	183.3	740.0	556.7
Oct.	19.0	263.3	513.3	196.7	746.7	530.0
Nov.	21.7	173.3	596.7	220.0	796.7	550.0
Dec.	22.0	120.0	606.7	170.0	760.0	486.7
	216.9	3,033.3	5,811.6	2,139.9	8,590.1	6,433.7

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

MONTHLY K.W. DEMAND - ILLINOIS STATIONS - cont'd.

	<u>Power #40</u>	<u>Power #A24</u>	<u>Power #43</u>	<u>Power #44</u>	<u>Power #45</u>	<u>Power #80</u>
Jan.	536.7	836.7	413.3	100.0	246.7	1,003.3
Feb.	486.7	860.0	363.3	126.7	193.3	983.0
Mar.	496.7	830.0	400.0	103.3	186.7	1,136.3
Apr.	393.3	770.0	353.3	46.7	146.7	940.0
May	500.0	753.3	393.3	113.3	223.3	950.0
June	473.3	660.0	286.7	93.3	176.7	833.3
July	403.3	640.0	276.6	70.0	176.6	880.0
Aug.	420.0	656.7	280.0	70.0	80.0	853.3
Sept.	490.0	776.7	420.0	--	70.0	903.3
Oct.	476.7	816.7	263.3	113.3	86.7	993.3
Nov.	523.3	840.0	303.3	193.3	133.3	1,003.3
Dec.	<u>476.7</u>	<u>810.0</u>	<u>336.7</u>	<u>110.0</u>	<u>266.7</u>	<u>1,060.0</u>
	5,676.7	9,250.1	4,089.8	1,139.9	1,986.7	11,559.1

	<u>High- wood Shops</u>	<u>Skokie Shops</u>	<u>Kenil- worth Signals</u>	<u>Glencoe Signals</u>	<u>Howard Station</u>	<u>Waukegan Signals</u>	<u>Zion Signals</u>
Jan.	47.3	90.7	5.0	5.0	16.0	10.0	3.0
Feb.	39.7	62.7	4.0	5.0	14.0	10.0	3.0
Mar.	40.7	62.0	2.3	3.3	14.0	10.0	3.0
Apr.	43.0	52.3	2.3	2.3	14.0	10.0	3.0
May	39.0	59.7	2.3	3.0	14.0	10.0	3.0
June	39.0	42.3	2.0	4.3	13.0	10.0	3.0
July	26.6	22.0	2.0	2.0	12.0	12.0	3.0
Aug.	28.7	30.7	2.3	2.0	13.0	11.0	2.0
Sept.	34.3	35.7	2.0	2.0	13.0	9.0	2.0
Oct.	37.3	51.0	2.7	2.7	14.0	9.0	2.0
Nov.	40.0	74.3	3.7	3.3	14.0	9.0	2.0
Dec.	<u>41.7</u>	<u>104.7</u>	<u>4.0</u>	<u>4.0</u>	<u>15.0</u>	<u>9.0</u>	<u>2.0</u>
	457.3	688.1	34.6	38.9	166.0	119.0	31.0

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

MONTHLY K.W., DEMAND AS RUN

	<u>P.S. Beach A.C.</u>	<u>Milw. A.C.</u>	<u>Total A.C.</u>	<u>P.S. D.C.</u>	<u>System Total</u>
Jan.	407.0	1,451.4	1,858.4	8,085	9,943.4
Feb.	523.0	1,186.3	1,709.3	7,799	9,508.3
Mar.	500.0	1,296.4	1,796.4	8,500	10,296.4
Apr.	403.0	1,205.4	1,608.4	7,646	9,254.4
May	333.0	1,270.9	1,603.9	7,614	9,217.9
June	397.0	1,260.1	1,657.1	7,026	8,683.1
July	290.0	1,445.6	1,735.6	6,988	8,723.6
Aug.	417.0	1,573.6	1,990.6	6,630	8,620.6
Sept.	-	1,552.2	1,552.2	7,433	8,985.2
Oct.	227.0	1,630.8	1,857.8	8,094	9,951.8
Nov.	167.0	1,659.2	1,826.2	8,379	10,205.2
Dec.	127.0	1,802.3	1,929.3	8,405	10,334.3
	3,791.0	17,334.2	21,125.2	92,599	113,724.2

MONTHLY K.W. DEMAND AS BILLED

	<u>P.S. Beach A.C.</u>	<u>Milw. A.C.</u>	<u>Total A.C.</u>	<u>P.S. D.C.</u>	<u>System Total</u>
Jan.	407.0	1,500	1,907	8,805	9,992.0
Feb.	523.0	1,500	2,023	7,799	9,822.0
Mar.	500.0	1,500	2,000	8,500	10,500.0
Apr.	403.0	1,500	1,903	7,646	9,549.0
May	378.0	1,500	1,878	7,614	9,492.0
June	397.0	1,500	1,897	7,026	8,923.0
July	366.0	1,500	1,866	6,988	8,854.0
Aug.	417.0	1,573.6	1,990.6	6,630	8,620.6
Sept.	-	1,552.2	1,552.2	7,433	8,985.2
Oct.	227.0	1,630.8	1,857.8	8,094	9,951.8
Nov.	167.0	1,659.2	1,826.2	8,379	10,205.2
Dec.	127.0	1,802.3	1,929.3	8,405	10,334.3
	3,912.0	18,718.1	22,630.1	92,599	115,229.1

Average Monthly Demand

Public Service Co.
Public Service Co.
Wis. Elect. Power Co.

D.C.
A.C.
A.C.

As Run

7,716.6
315.9
1,444.5
9,477.0

As Billed

7,716.4
326
1,559.8
9,602.2

DISTRIBUTION AND POWER DIVISION

POWER STATISTICS FOR YEAR - 1954

<u>Substation</u>	<u>Installed Capacity K.W.</u>	<u>Cycle</u>	<u>Number of Units</u>
No. 30 Skokie	2,000	60	1
No. 31 Lake Ave.	1,500	60	1
No. 32 Kotz Rd.	1,500	60	1
No. 33 Deerfield Rd.	1,000	60	1
No. 34 Old Mill Rd.	1,500	60	1
*No. 35 Laurel Ave.	1,000	60	2
No. 36 Libertyville	1,500	60	1
No. 37 Central St.	2,000	60	2
No. 38 Winnetka	1,500	60	1
*****No. 39 Ravinia	2,000	60	2
No. 40 Ft. Sheridan	1,500	60	1
No. A24 No. Chicago	1,500	60	1
*No. 43 Pine St.	1,900	60	1
No. 44 Beach	1,000	25	1
No. 45 Winthrop Harbor	1,200	60	1
*No. 80 Lake Bluff	<u>1,900</u>	60	<u>1</u>
	24,500		19
**McKeon Rd.	1,000	25	2
Kenosha	1,000	60	1
***Bose Rd.	1,000	25	1
****Racine	1,000	25	2
Quarry	1,000	25	1
4-Mile Rd.	500	25	1
*Nechuta Rd.	1,500	60	2
Carrollville	1,000	25	2
College Ave.	500	25	1
Harrison St., Milwaukee	<u>2,000</u>	25	<u>2</u>
	10,500		15

*NOTE: All substations are rotary converters except Nos. 35, 43, 80 and Nechuta, which are Mercury Arc Rectifier Stations.

**Converted to 1 - 1500 KW 60-cycle rotary June 28, 1954

*** " " 1 - 1000 KW 60-cycle " December 3, 1954

**** " " 1 - 1000 KW 60-cycle " December 30, 1954

*****One unit taken out of service March 8, 1954 and moved to Bose Road September 14, 1954.

DISTRIBUTION AND POWER DIVISION

ANNUAL INSTALLATIONS

<u>Year</u>	<u>Miles Trolley Wire</u>	<u>Wood Poles</u>	<u>45,000 V. Insulators</u>	<u>Anchors</u>	<u>Back Guys</u>	<u>Rail Bonds</u>	<u>No. of Trolley Wire Breaks</u>
1946	8.16	156	258	137	425	6,489	*
1947	5.81	104	182	150	150	5,444	17
1948	2.00	10	114	82	577	2,300	4
1949	7.85	72	235	451	461	3,024	22
1950	7.00	130	117	273	397	2,708	11
1951	4.99	223	82	144	289	2,976	16
1952	3.5	153	217	135	221	3,211	10
1953	2.73	130	167	225	406	1,760	12
1954	2.03	97	261	218	267	567	6

*Number of Wire Breaks not available for 1946

DISTRIBUTION AND POWER DIVISION

FACILITIES MAINTAINED

Crossing Protection

	<u>1954</u>	<u>1953</u>
Autoflag - Locations	14	14
Bell and Light Signal	2	2
600 Volt Bell on Gate	6	6
Electric Lighted Crossings	63	63

Overhead Trolley

Catenary Construction - D.T. Miles	32.04	32.04
Wood and Steel Poles -Main Line-D.T. Miles	69.94	69.94
Steel Poles - Milwaukee - D.T. Miles	2.73	2.73
Wood Poles - Yards & Sidings - S.T. Miles	43.13	42.94

Lighting

Passenger Stations	35	35
Freight Stations	8	8
Shops and Car Houses	4	4
Substations	10	10
Office Buildings	2	2
Miscellaneous Buildings	31	31
Station Platforms and Shelters	222	222
Yards	8	8

Substations (Operated by CNS)

Manual	3	3
Automatic	7	7

Transmission Line - Miles

60-cycle - 33,000 volt - 3 wire	24.25	24.25
* 60-cycle - 33,000 volt - 3 wire	1.95	8.85
** 60-cycle - 33,000 volt - 3 wire	1.70	-
60-cycle - 26,400 volt - 3 wire	5.20	-
25-cycle - 33,000 volt - 3 wire	45.65	45.65
* 25-cycle - 33,000 volt - 3 wire	2.71	2.71
* 25-cycle - 13,200 volt - 3 wire	2.71	2.71
* 25-cycle - 13,200 volt - 2 wire	2.94	2.94
60-cycle - 2,300 volt - 2 wire	55.6	54.6

Feeder Cable - Single Wire Miles

Copper Feeder Cable	169.28	169.28
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* Not in use

** Removed in Nov. 1954