THE MILWAUKEE ELECTRIFICATION – A Proud Era Passes

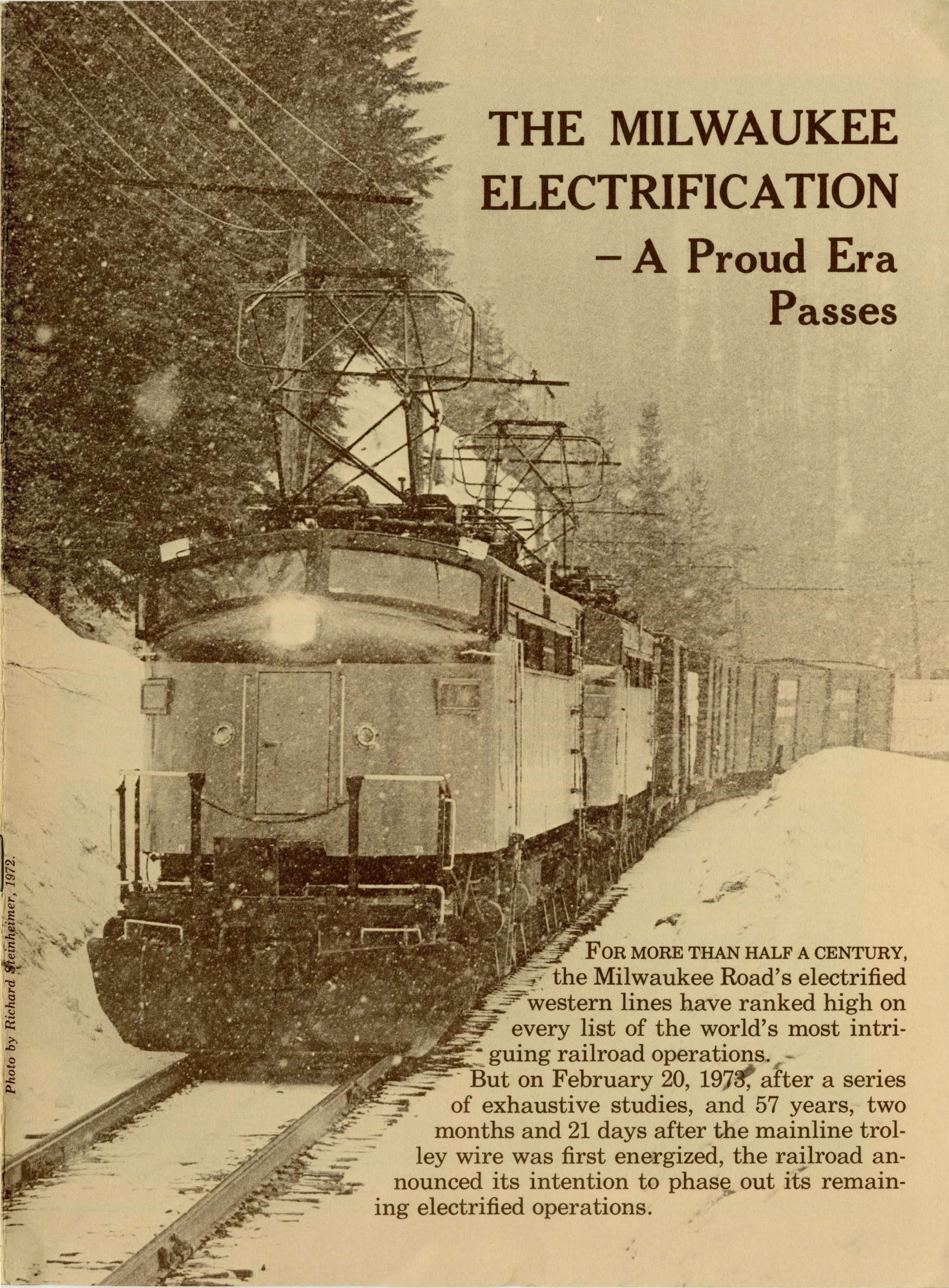


Photo by Richard Steinheimer, 1972.

FOR MORE THAN HALF A CENTURY, the Milwaukee Road's electrified western lines have ranked high on every list of the world's most intriguing railroad operations.

But on February 20, 1973, after a series of exhaustive studies, and 57 years, two months and 21 days after the mainline trolley wire was first energized, the railroad announced its intention to phase out its remaining electrified operations.

The Milwaukee Road's first electric freight locomotive, No. 10200 AB, shown on display in Butte, Mont., during October 1915. On Nov. 30, 1915, No. 10200 powered the first train to run under the Milwaukee mainline catenary, from Three Forks, Mont., to Deer Lodge, Mont., a distance of 112 miles.

Initially an unmatched technical marvel, the electrification gained widespread fame as the apparent prototype for a new, electric, era in railroading. That era never arrived, but the Milwaukee Road's electrification, highly successful as it was, became and for years remained an object of intense interest as a unique, working railroad operation.

While the interest continued, the electrification system gradually became something of an anachronism.

In the end, however, two factors which had once been the source of much of the electrification's renown and were once its strongest virtues, technical progress and economics, proved its undoing.

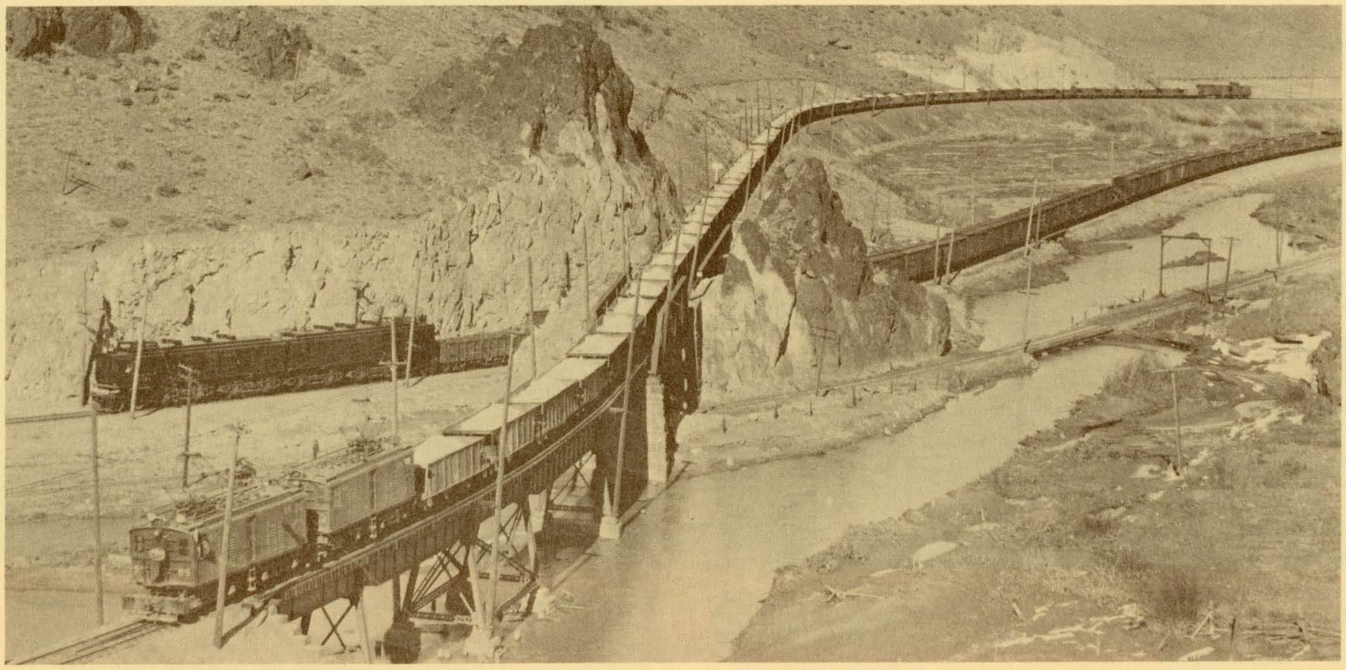
While a definitive technical statement in 1915, the Milwaukee's electrification was rendered obsolescent by vast advances in electrical engineering made since then.

Although electrification was for many years a boon to the Milwaukee's finances, it was becoming a drain on the treasury, because spare parts for its electrical system and locomotives are no longer readily available and the increasingly frequent repairs have been growing more costly and more difficult to perform. But the major economic factor was the need to eliminate operating inefficiencies caused by the separation of the two electrified segments by an unelectrified gap. An in-depth analysis based on a wide variety of factors indicated that the substantial investment needed to close the gap and acquire new equipment for electric operation would have been economically unwise for the railroad. Switching to fully dieselized operation thus became the only alternative.

Throughout its useful lifetime, the Milwaukee Road electrification served well, but its inception was primarily a product of the need to overcome problems which no longer exist. The more than 3,000 miles of transmission, feeder and trolley wire still strung over 902 miles of Milwaukee Road track in Montana, Idaho and Washington is evidence of how well those particular problems were met in the early 1900s when the project was undertaken.

The entire electrification project, consisting of the trolley and feeder system, poles, transmission lines, electrical substations and locomotives represented an investment of approximately $23 million, a huge amount of private capital in pre-World War I America.

Its cost today would be several times the original figure, a prohibitively large sum given the present traffic density of the line. But the Milwaukee Road's electrification has long since paid for itself, and has rewarded the railroad many times over for the original investment through years of economical, dependable and almost trouble-free service.



An ore train of the Butte, Anaconda and Pacific Railway crosses over a Milwaukee Road freight near Butte, Mont., about 1916. The successful electrification of the BA&P greatly influenced the Milwaukee in its decision to electrify throughout the mountains of Montana, Idaho and Washington.

Specifically, the Milwaukee Road's electrification crosses five mountain ranges and covers 656 route miles of main line in two separate divisions: 440 miles between Harlowton, Mont., and Avery, Ida., and 216 miles between Othello, Wash., Seattle and Tacoma.

When these sections were placed in full electrical operation (Harlowton to Avery in 1917 and Othello to Tacoma in 1920) they represented the first long-distance electrification in North America and were the longest electrified lines in the world.

Importantly, they also represented the first electrification for solely economic reasons. Other railroads had electrified to eliminate smoke in tunnels and terminals, to increase track capacity or to help conventional trains over difficult grades. But in these cases, electrification was merely an adjunct to the then-prevailing steam power.

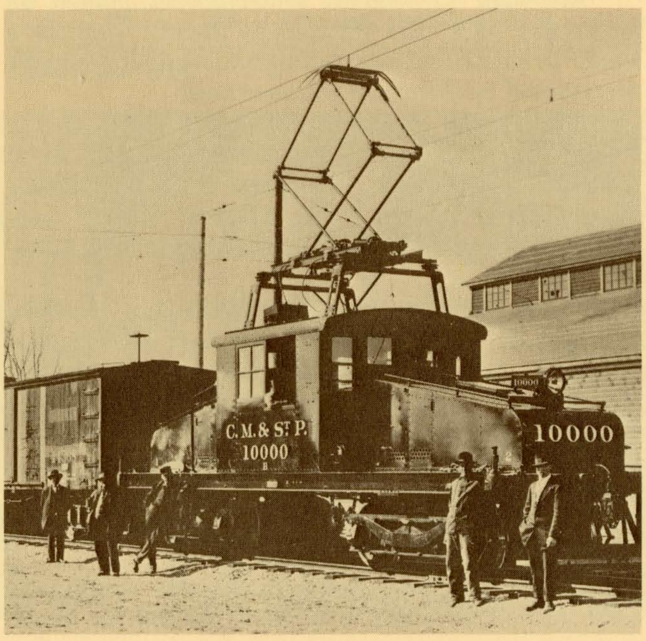
When the Milwaukee electrified, it abandoned steam entirely on the electrified sections with the intention of saving money and improving both passenger and freight service.

Besides offering passengers on the famed transcontinental Olympian an unprecedentedly smooth and smoke-free ride through the grandeur of the Belt, Rocky, Bitter Root, Saddle and Cascade Mountains and ensuring dependable schedules year round, the Milwaukee's electrical operation was highly successful economically and led the way for other similar projects around the globe.

In a span of just a few years, due to the Milwaukee Road's innovative efforts and electrical expertise, its electrified main line became the "most widely known section of railroad track in the world . . . beyond question," according to one observer of the period.

Celebrities frequented the prestigious transcontinental Olympian between Chicago and Seattle, providing pictures and quotes for the news and publicity mills of the time.

The earliest electric operation on the Milwaukee Road began in the summer of 1915, when switcher 10000 went into service in the yard at Great Falls, Mont. The small 1,500 volt D.C. switching operation was installed primarily to abate noise and smoke over a four-mile section of track which ran through the town's main business district. Its use was discontinued about 1937.



Thomas A. Edison marvelled at the smooth ride, Babe Ruth posed in the cab with an engineer, and President Warren G. Harding operated an electric locomotive for a stretch, occasioning the installation of a plaque on the side of the cab which read: "Chicago, Milwaukee and St. Paul Ry./To Puget Sound—Electrified/July 2, 1923/Warren G. Harding/President of the United States/Operated Locomotive No. 10305/Westbound Sappington, Mont./to Avery, Idaho."

More importantly, throughout the 1920s, a steady stream of engineers and railway officials from all over the world came to observe this new American engineering marvel. Representatives from at least 17 countries in Asia, Africa, Europe, North America and South America visited the Milwaukee Road's western lines. That they were impressed with what they saw was evident, because almost all of those countries built electrified lines soon afterward and several, notably Brazil, Chile, Argentina, Spain and France, adopted many of the Milwaukee's new techniques.

Although the railroad gained great international fame and publicity for its revolutionary passenger service and technological sophistication, economics remained the primary reason for electrification.

Electrified operation provided great savings over steam operations, and this occurrence came as no surprise to the railroad.

A. J. Earling, president of the railroad from 1899 to 1916, had headed a study group in 1912 which determined that sizeable economies, primarily in the form of greater hauling capacity over the mountains, lower locomotive maintenance costs and better locomotive utilization, would be realized if electrification was undertaken. The 1912 study proved accurate, and by 1927 the electrification had more than repaid the initial investment in operational savings.

Although far-sighted management played an important part, the Milwaukee Road's role as a leader in electrified railroading was to a large degree determined by historical circumstance.

As the last transcontinental line to reach the Pacific, the Chicago, Milwaukee and St. Paul (as it was then called) had at its disposal in the first decade of the 20th Century a vastly different level of technology than was available to earlier transcontinental builders.

By 1909, limited electrifications for terminal and tunnel operations had been proved feasible elsewhere. At the same time, commercial demand for electricity was growing and the vast potential for hydro-electric power in western states was being developed. With this technology available, the possibility of electrical operation was considered as early as 1905 and 1906 while land for the extension was being acquired.

As they planned and surveyed the route, officials and construction engineers learned for themselves the benefits which electrification could provide. The long distances to Midwestern coal supplies, an abundance of hydroelectric potential close at hand, the long, severe winters and difficult terrain all underscored the advantages of electrifying.

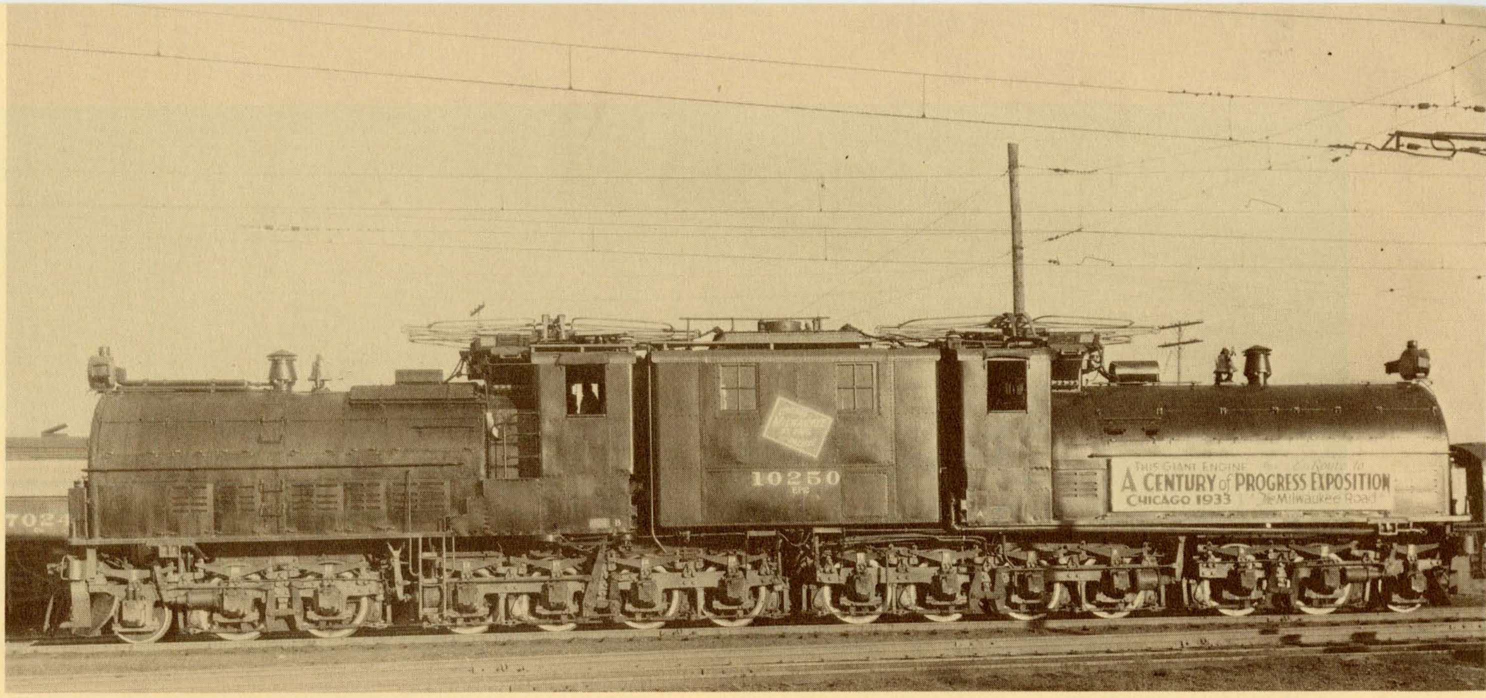
The substation and residences at Drexel, Mont. are shown as they looked shortly after their construction in 1916. Twenty-two such installations were built along the electrified portion of track to convert the 100,000 volt A.C. delivered by the power companies to the 3,000 volt D.C. required for electrified operations.

As a result of these early considerations, parcels of land were purchased and set aside for possible electrical substations, and flow rights for generating dams were secured, all before the extension was completed.

But construction of the extension as a conventional railroad proceeded. Having the experience of earlier westward builders to draw on, and having the advantage of the Northern Pacific Railroad already close by to bring materials to work crews, construction of the extension proceeded remarkably well. Well-planned and highly organized, the 1,400-mile Pacific extension project was completed in slightly more than three years, from Glenham, S.D., to Seattle.

Limited operations were underway in some places in 1908 and the line was opened from Chicago to Seattle in 1909. However, the problems of operating steam locomotives year-round through the mountains in Montana and Idaho all too soon became apparent.

Steep grades, constant curvature and frequent tunnels made steam operation on the extension trying even in good weather. But long, bitter cold winters, bringing heavy snowfall and temperatures as low as 40 degrees below zero, compounded the difficulties. In cold weather, steam locomotives were extremely difficult to maintain, often suffered significant power losses, and sometimes simply wouldn't run. Even in good weather, mountain grades and curves



Bi-polar No. 10250 shown in its way to the 1933 Century of Progress Exposition in Chicago. Unique in both appearance and design, the railroad's five Alco-GE bi-polars were the star performers of the passenger fleet for nearly 40 years.

caused steam locomotives to lose a great deal of power.

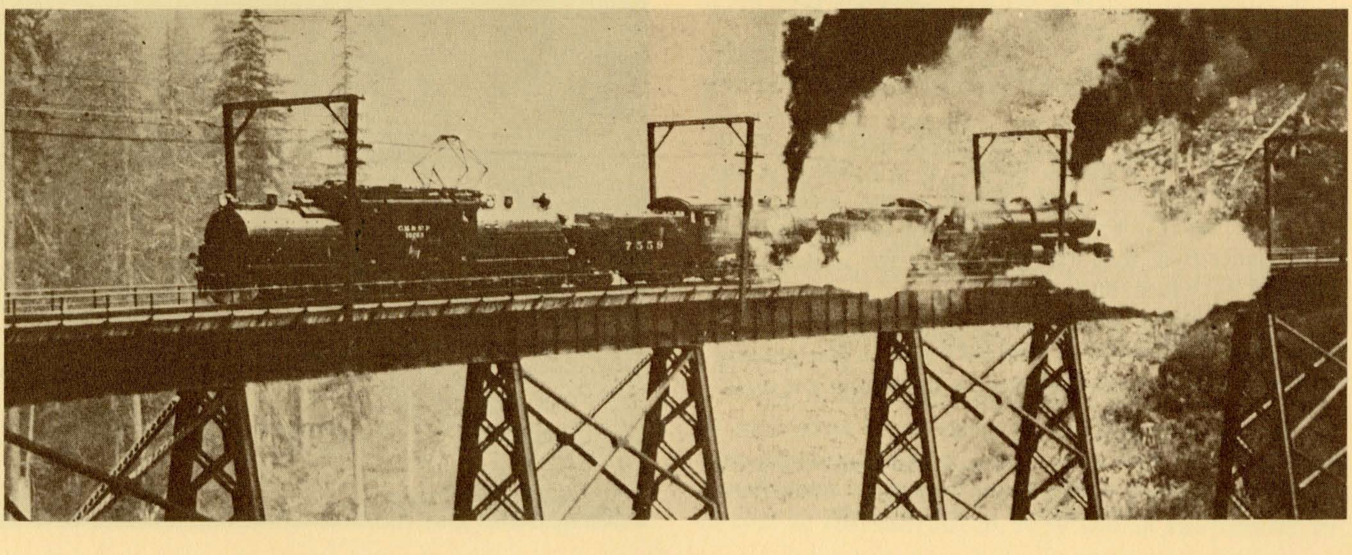
The success of two other electrification projects in the Milwaukee's territory brought further impetus for electrifying. In 1909, the Great Northern electrified its line through the Cascade Tunnel, and demonstrated the superiority of electric over steam operation in the difficult winter conditions. Of more direct impact was the highly successful electrification of the ore-carrying Butte, Anaconda and Pacific Railroad which connected with the Milwaukee. Watching the BA&P work out the problems of mountain electrification on a small scale, Milwaukee officials became certain that it could be done larger and better.

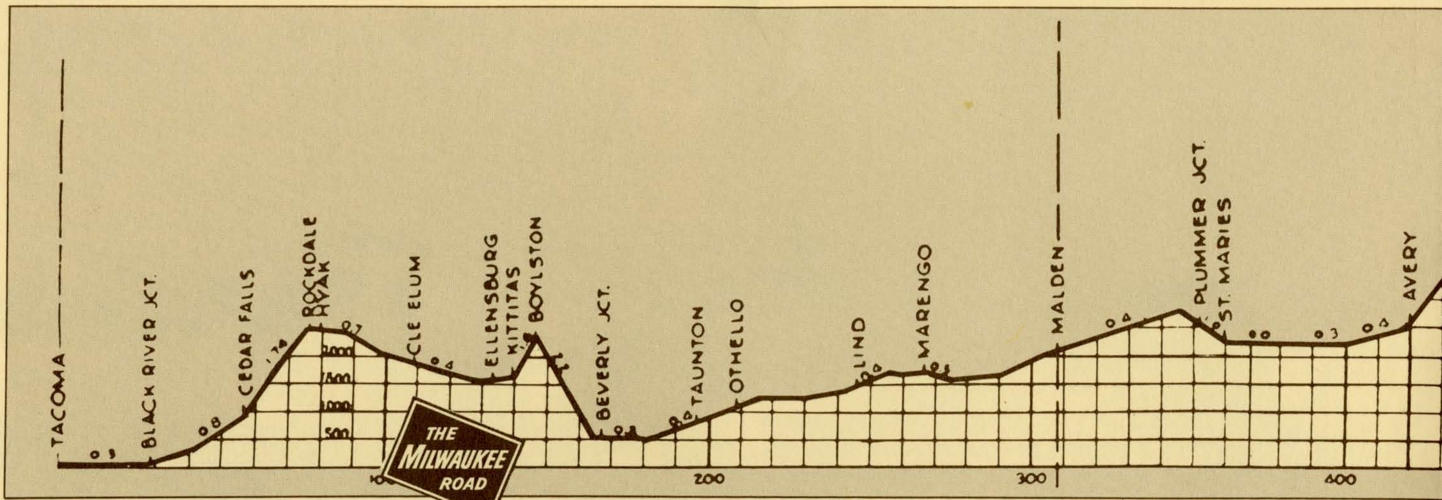
With electrification thus a very real technical possibility, and with the problems of steam operations all-too-frequently demonstrated, research was begun in 1912 to determine the feasibility of electrification from Harlowton to Avery and the most advantageous system to adopt.

After this exhaustive study of all the factors and possibilities was completed, the board of directors voted to electrify with a 3,000-volt, direct current, overhead supply system.

On the railroad's board of directors at this time was John G. Ryan, president of the Anaconda Copper Mining Company and a director of a local power company. Ryan's interests in these inter-related fields undoubtedly helped sway the rest of the board toward electrifying, and his special expertise and influence helped ensure that it would be done smoothly and efficiently.

One of the most famous exploits of the Milwaukee bi-polars were "tugs-of-war" staged to show the tremendous tractive effort and regenerative braking powers of these electric locomotives. The test shown here was conducted on one of the high bridges in Snoqualmie Pass on the railroad's Coast Division about 1925.





THE COAST AND ROCKY MOUNTAIN DIVISIONS OF THE MILWAUK

Late in 1912, the first contract for power supply was signed with the Montana Power Co. Work on the electrification began in April of 1914.

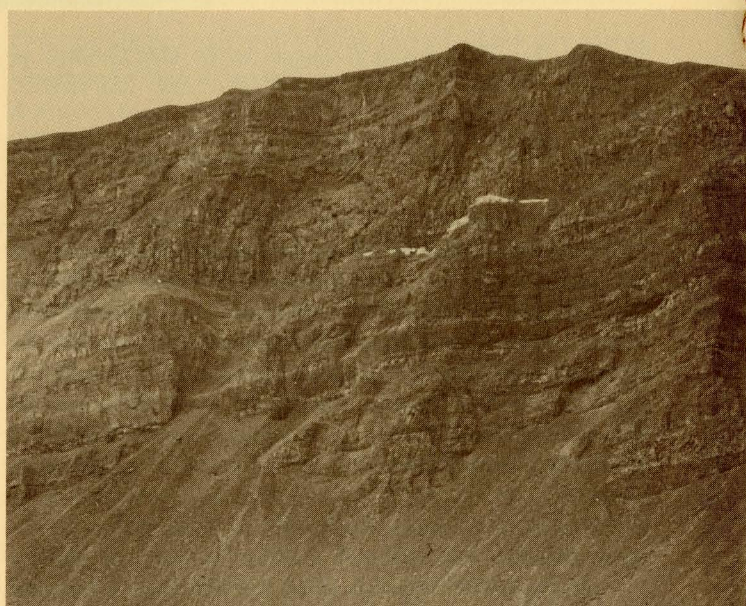
On November 30, 1915, the trolley wire was energized for the first electrically-operated train to run on the Milwaukee Road, a 112-mile special from Three Forks to Deer Lodge, Mont. Electrical operations were gradually extended over the entire line from Harlowton to Avery, and steam locomotives were almost completely supplanted by the end of 1916. Full electrified operation from Harlowton to Avery began in early 1917.

From the outset, the electrification was far more successful than had been anticipated. With this success, authorization was quickly given in 1917 to electrify the Coast Division from Othello to Tacoma, Wash. On this line through the Saddle and Cascade Mountains, tunnels, curvature and snowfall made steam operation difficult for a large part of the year. The steepest grades on the mainline are also on the Coast Division.

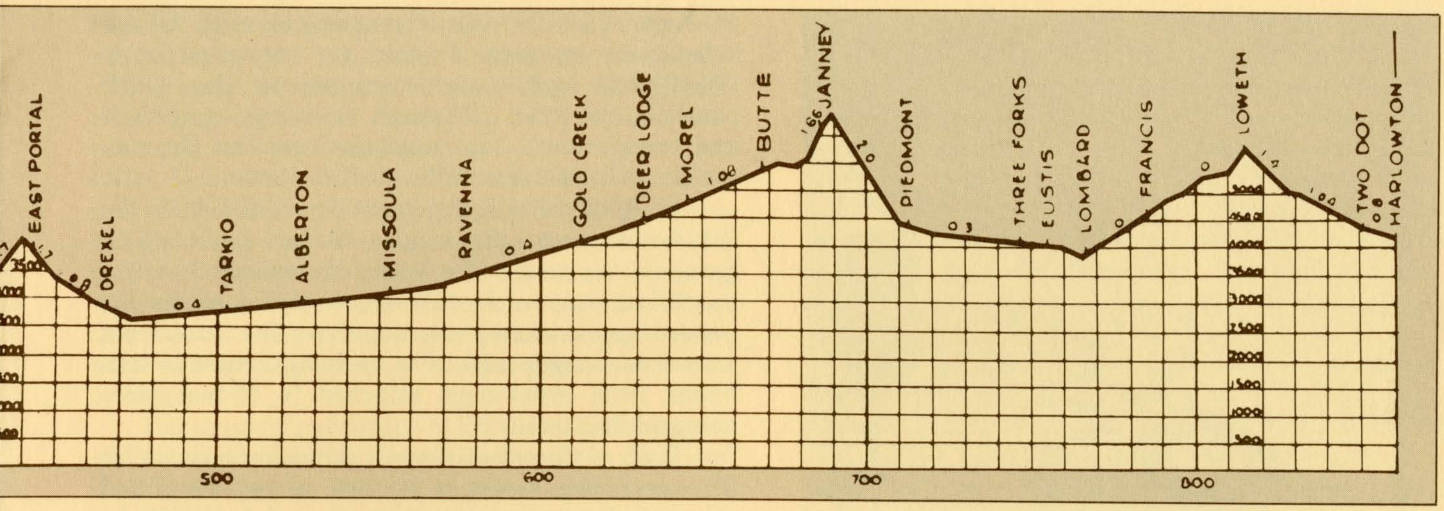
Quite naturally, the same electrical system was chosen, and by the fall of 1919, electrical helper service was started on several of the grades. The line to Tacoma was completely electrified by March of 1920, and the last leg, a nine-mile section from Black River Junction, Wash., into Seattle, was electrified in 1927.

Between the two electrified sections, from Avery, Idah., to Othello, Wash., is a relatively flat 210-mile stretch of track which is not electrified. The "gap," as it is known, was at one time scheduled to be electrified, and electric power for it was once reserved with local suppliers.

The planners' intent to electrify the railroad all the way to the Pacific is also reflected in the present numbering of the substations. Substations are num-



Alco-GE boxcab E-22, one of two such units streamlined for passenger service in 1953, shown in freight service near Beverly, Wash., on the railroad's Coast Division.



EE ROAD, SHOWING THE GRADE AND ALTITUDE PROFILE FROM TACOMA TO HARLOWTON

bered westward, starting with No. 1 at Two Dot, Mont., and continuing on the Rocky Mountain Division to No. 14 at Avery, Ida. Substations 21 through 28 are on the Coast Division between Taunton, Wash., and Tacoma. The allowed for six numbered stations in the gap were never built.

The line through the gap, relatively flat and straight, lacked the immediate operating difficulties of the other two segments. The gap therefore had the lowest priority for electrification, since steam power could do the job well.

Shortly after the Coast Division electrification was completed, the national economy took a downturn. Due to a resulting lack of traffic development on the extension, a concurrent difficulty in obtaining capital, and the fact that through passenger and freight traffic moved over different routes near Spokane, Wash., all plans for electrifying the gap were dropped by 1921.

Traditionally, the "gap" has posed several problems, but the primary one has been locomotive utilization. With electric locomotives restricted to only parts of the 900-mile run between Harlowton and Tacoma, the railroad has been restricted in its operational flexibility. Because of the need to improve flexibility, conversion to all electric or all diesel on the western lines has been discussed for many years but neither had been found advantageous prior to now. Branch line operations on both electrified sections have always been non-electrified.

But in the 1920s, results from the two sections which were electrified were no less than astounding. Immediately, the railroad experienced drastic cost savings and the electrification rapidly began to pay for itself.

At the time of the electrification, fully 14 per cent of the railroad's equipment was doing nothing but hauling coal for steam engines in the West. Most of this equipment was immediately released for revenue service.

Also, the expense of maintaining coaling and watering facilities for steam engines was eliminated on these sections.

Since the Milwaukee did not have extensive coal resources in the West, the burdensome expense of hauling coal from the Midwest to points in Washington, Idaho and Montana was also greatly reduced.

Following a large forest fire in Idaho, laws were passed prohibiting the use of coal or wood-burning locomotives through National Forest lands. Although a number of locomotives had already been converted to oil burning operation, under electrification the railroad was freed from dependence on oil, the price of which rose sharply during and after World War I. To a large extent it was also spared the expense of storing and hauling fuel oil in this area.

The over-all cost of fuel, comparing the cost of coal burned per ton-mile to the cost of electricity used per ton-mile, was cut by two-thirds. Maintenance costs, always sizeable with steam engines, were cut 75 per cent. In addition, because of the rapid turn-around time of the electric locomotives, their 24-hour-a-day availability for service, and their higher speeds and hauling capacity, locomotive and train crew productivity rose sharply.

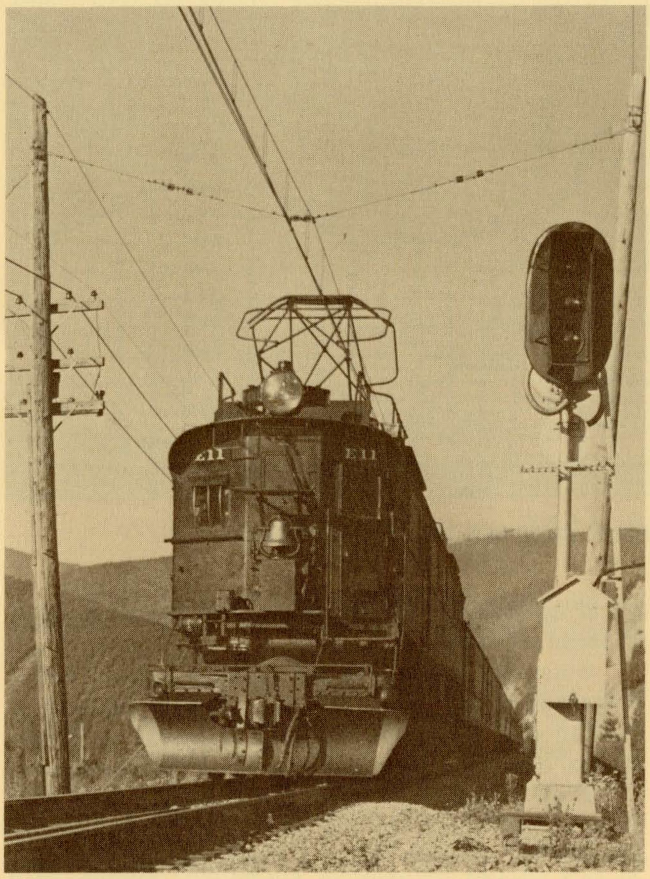
These operational economies allowed the Milwaukee to quickly recoup its investment and have provided ongoing savings that have helped cushion the railroad during some financially difficult times.

Today, the electrical system remains in operation largely as it was built. Wires, poles, signal and electrical equipment have been replaced as needed, but the bulk of the system endures intact.

Electrical power for the system is provided by the Montana Power Company, the Washington Water Power Company and the Puget Sound Power and Light Company.

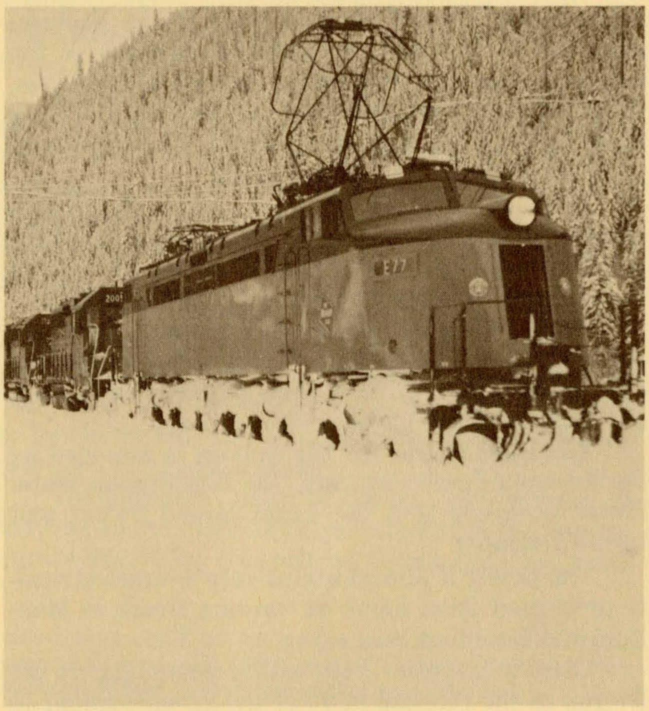
The power is almost exclusively hydroelectrically generated from dams on various rivers in Montana and Washington.

Electricity from these utility companies is delivered to the railroad at 10 of the 22 substations in



ABOVE: Baldwin-Westinghouse electric E-11 pulls the "Olympian" through the Bitter Root Mountains in 1941. Ten of these locomotives were delivered to the railroad in 1919-20 for passenger service on the Rocky Mountain Division.

BELOW: Little Joe E-77, operating as a booster for a five-diesel through-freight consist, plows its way through a fresh snowfall on the Rocky Mountain Division.



the form of 100,000-volt alternating current. All the substations on each division are connected by a 100,000-volt high-tension transmission line which parallels the track. Through electrical equipment and transformers, the substations convert the current to the necessary 3,000-volt D.C. current.

At 3,000 volts D.C., electricity is fed from the substations into the copper feeder cable which parallels the track. The feeder is connected at frequent intervals to the two copper trolley wires suspended approximately 24 feet above the track from a steel messenger cable. The messenger cable in turn hangs from cross-arms attached to 40-foot poles alongside the track.

Each of the substations is primarily responsible for energizing a certain section of catenary, and intervals between substations were determined by probable power demand on that section of track. They are closer together on steep grades, for example, where power requirements are greater.

To obtain electricity from the catenary, the locomotive is equipped with a device called a pantograph. Spring-loaded, the pantograph rides underneath the wire, collecting energy and feeding it through control devices to the electric motor. When electricity is introduced into the motor, a magnetic field is created, causing the motor's armature to revolve and, usually through gears, propelling the locomotive.

Strictly speaking, the term "electric locomotive" is a misnomer. Locomotive implies a completely self-driven machine, but the electric units contain no energy producing mechanism, only a motor. They convert electrical energy supplied from the wire into mechanical energy which moves the train.

The twin catenary supply system, developed especially for the Milwaukee, was designed to provide a steady supply of energy to the motor and eliminate sparking by ensuring that constant contact between the pantograph and the catenary would be maintained. Secondary tracks, yards and passing tracks normally have only one trolley wire.

To complete the necessary circuit, electricity is returned to the substation through the rails and in some areas through supplementary feeder cables atop the poles.

Of the 22 substations in the two zones, 11 are operated by supervised remote control and one is fully automated.

Although the eight substations on the Coast Division and the 14 substations on the Rocky Mountain Division are interconnected electrically on each division, each substation is equipped with circuit breakers, disconnect equipment and bypass circuits to allow continued operation on other parts of the line if the substation, wires or circuitry in one section should become inoperative.

Included in the railroad's original investment in electrification were 42 electric locomotives, 30 for freight and 12 for passenger service. Ordered from

General Electric Company, which built the electrical components, and American Locomotive Company, which built the mechanical part, these 42 locomotives, each capable of developing 4,050 horsepower, consisted of two semi-permanently coupled cab units. Delivered between 1915 and 1917, they have proved themselves lasting tributes to the men who designed and built them, as well as those who have operated and maintained them. Although changing motive power requirements have brought modification of the units, 23 of the original 84 single units were still available for use when the phase-out was announced.

Subsequent purchases in 1920 and 1950 brought the total number of electric locomotives acquired to 128. As late as 1960, 98 of those units were still operating.

Several of the original units were altered at various times, some having cab and pilot wheels removed for use as non-control units, some rebuilt as shorter freight units, and some redesigned and modified for streamlined passenger service.

Originally designated EP-1 and EF-1, the first GE-Alco units are today used in various combinations of two, three or four cab and cabless units, as switchers, helpers and local freight locomotives with the designations EF-2, EF-3, ES-3 and EF-5.

The first electric locomotive to arrive on the system was No. 10200, proudly heralded by the railroad and the builders as the largest electric locomotive in the world. Not only was it the largest, but it was the first direct current electric locomotive to operate at a potential as high as 3,000 (later 3,400) volts, and the first to employ regenerative braking.

This same unit, perhaps the oldest working locomotive in the country, is still available for service in Deer Lodge, Mont. as No. E-50AB.

Regenerative braking, little understood in 1915 except by electrical engineers, is a technique which simplified and increased the safety of mountain operation, reduced wear on brake shoes and actually recovered electrical power and returned it to the overhead system for use by other trains.

The Milwaukee has long been proud of this feature. The *Milwaukee Road Magazine* in 1916 described regenerative braking as "a process of producing electrical current within the motors of the locomotive by converting the motors into generators, and the current thus produced being returned to the trolley; and the force of gravity which tends to make the train run away down grade is the power that drives the generators, and the work thus performed operates to hold the train back."

Once on a down grade, the engineer throws a switch in the cab and regeneration takes over. The desired speed is maintained by use of the line current control. The trains are equipped with air brakes, but air is used only while switching into regenerative braking and as a back-up system in case of emergency.

Returning current to the line has proved an economic boon, since 40 to 60 per cent of the power used ascending a grade can be returned while descending. With the numerous grades in the Milwaukee's mountain electrification, the railroad recovers about 12 per cent of the total energy used by its electric locomotives and returns it to the system, powering other locomotives or receiving credit from the power suppliers.

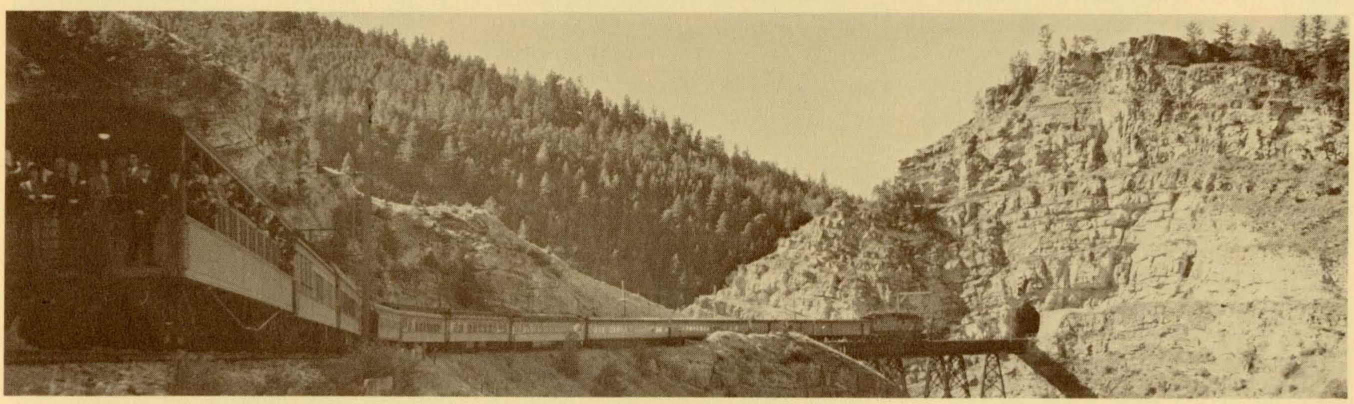
Regenerative braking is now widely used throughout the world and has been a feature of all other types of Milwaukee Road electric locomotives.

A second type of electric used by the Milwaukee Road was the now-famed "bi-polars," Class EP-2. Unique in both appearance and design, the five bi-polars were passenger locomotives with a long record of outstanding service.

They were gearless electric locomotives, meaning that the armature of the motor was also the driving axle. When current was introduced and the magnetic field forced the armature to turn, it turned the wheels directly, not through gears as was the case in other types of electrics.

Long, low, and multi-wheeled, the bi-polars

The Milwaukee's famed "Olympian," powered by a Baldwin-Westinghouse electric locomotive, is shown at Eagle Nest Tunnel in Montana Canyon (near Ringling) in 1939. The complete absence of smoke and cinders on the railroad's electrified districts made it possible for passengers to enjoy the luxury of riding in open observation cars through the grandeur of mountain scenery along the route.



Alco-GE boxcab E-47A pulls an eastbound freight through the Cascade Mountains on the railroad's Coast Division near Hyak, Wash., in July 1970. Photo by Tom Brown.

were once called "centipedes on rails." They were built by General Electric-Alco and were delivered in 1919 and 1920.

The unique appearance of these locomotives made them the star performers of the railroad's electric passenger fleet. The low curved hoods of the massive bi-polars showed up on almost all of the railroad's transcontinental passenger advertisements from the 1920s into the 1950s.

Designed to run at 70 m.p.h. and capable of up to 4,120 horsepower, a single unit could handle a whole train over any grade on the line with smooth, silent, smokeless power.

The simple but rugged bi-polars gave years of almost trouble-free service in the Cascades. A railroad policy change ended their use on the Olympian Hiawatha in 1956, and eventually they were put in storage at the railroad's Deer Lodge, Mont., shops. An attempt to convert the units to freight service was unsuccessful, and as a result, in the early 1960s, four of the units were scrapped. The fifth was donated to the National Museum of Transport in St. Louis, Mo., in 1961.

Probably the most famous exploit of a Milwaukee Road bi-polar was a "tug-of-war" held at Erie, Pa., in 1920.

Fresh off the production line, No. 10251 was coupled nose to nose with two modern steam engines at the General Electric plant. Actually it was to be a pushing rather than a pulling contest since drawbars of the time would not have been able to withstand the tremendous stress.

From a standstill, the throttles of the steam engines were opened first and the bi-polar was pushed slowly backwards down the track. Then the electric began to draw power. Simultaneously, the throttle of the electric was opened further and the steam engine throttles were advanced to their last notch. With a tremendous effort, the steam engines smoked and pushed and strained, but they came to a complete halt. As the controller of the bi-polar was advanced still further, the steam engines, with drive wheels still churning, were pushed backwards.

In a similar test of regenerative braking, the two steam engines pushed the electric until regenerative braking was switched on. As regeneration was turned to full power, the pushing locomotives slowed down. With throttles wide open, the steam engines could scarcely budge the electric which, besides winning the contest, was returning electricity to the overhead trolly wire.

Similar tests were later held on Milwaukee Road track in the west, with the bi-polars emerging victorious each time.

At the same time the five bi-polars were ordered for use in the Cascades, ten passenger locomotives for use in Montana and Idaho were ordered from Westinghouse and Baldwin Locomotive Works, the only electric locomotives not purchased from the Alco-GE combination. The railroad split its order between Alco-GE and Westinghouse-Baldwin for faster delivery, since the rapidly rising cost of fuel oil used for steam engines then in service was a severe financial drain.

Built for the same high-speed, heavy-duty passenger service as the bi-polars, the EP-3s, as they were designated, had a much more conventional box-cab design.

Although they performed well, the EP-3 locomotives were scrapped shortly after the Korean War due to high maintenance costs and a general decline in passenger traffic.

The present mainstay of the Milwaukee Road's electric power fleet are the "Little Joes," the EF-4 locomotives.

These Alco-GE units, dubbed "Little Joes" after Josef Stalin because they were originally built for use in the Soviet Union, were acquired in 1950.

With the advent of the Cold War, essential equipment going to Russia was embargoed and the locomotives, ordered by the U.S.S.R., were never delivered. Twelve of the units were purchased by the Milwaukee Road, with others going to the Chicago South Shore and South Bend Railroad and the Paulista Railroad of Brazil.

Built for the Russian 5' gauge track, the "Little Joes" were modified for standard American 4'-8½" gauge at the railroad's Milwaukee Shops and put into service. Train heating boilers (since removed) were also added to two of the units for passenger service.

Purchased at very favorable prices, the powerful EF-4s have proved highly versatile and reliable. Each unit develops 5500 h.p. and is capable of running at 70 m.p.h., making them valuable additions to the motive power fleet. But now even the "Little Joes" are nearing the end of their life expectancy.

The fortuitous availability of these units in 1950 may have single-handedly extended the life of the electrification. At that time the original electric locomotives were rapidly wearing out and a policy decision seemed in the offing on whether to invest heavily in new electric units or to broaden the dieselization program to include phasing out the electrics as well as steam locomotives. But the decision never had to be made.

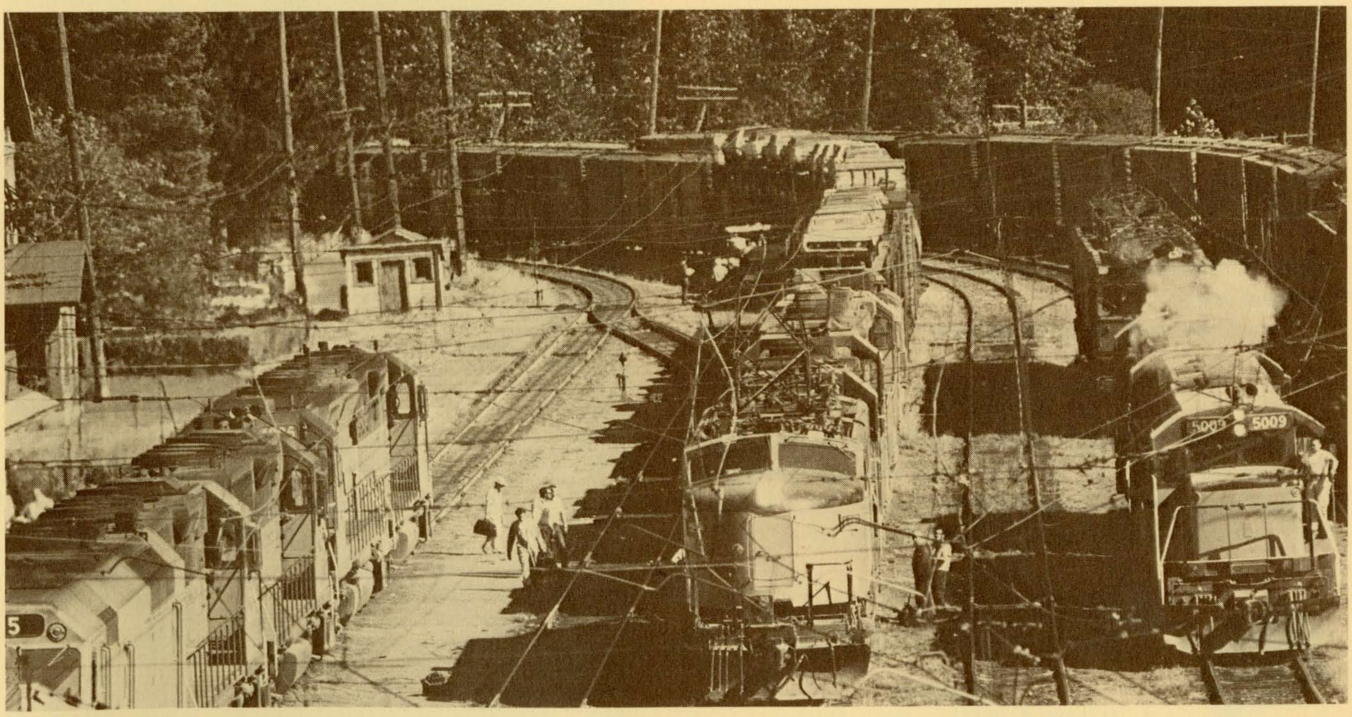
Because of the cost and the wide variety of difficulties involved with it, electrified operation has decreased steadily in recent years. Advances in diesel locomotives have negated many of the one-time advantages of electrified operation.

Use of electric locomotives on the Rocky Mountain Division has for several years been limited to helper, booster and yard service. No electrically powered trains have moved on the Coast Division since 1971.

Electric operations on the Rocky Mountain Division accounted for about 19 per cent of the locomotive miles operated on that division in 1972. Only three per cent of the total locomotive miles operated on the entire Milwaukee Road system in 1972 were electrically operated.

Viewed in this context, the announcement of the decision to phase-out the electrification was not a major change in policy, but was rather official ac-

Its a busy morning in Avery, Idaho as transcontinental freights 261 and 262 stop to change crews and adjust their power consists. Westbound 261 will drop its Little Joe electric and operate with diesel power for the remainder of its trip to the West Coast, and Eastbound 262 will add a Little Joe to aid its diesel power in traversing the Rocky Mountain Division. Photo by Tom Brown, August 1971.



knowledgement of the inevitability of existing operational realities.

No hard date for the end of the electrification has yet been set. The exact date will depend on several factors, including the availability of diesel motive power to replace the electrics. But Milwaukee Road crews are at work on the Coast Division taking down overhead wires. The scrap value of the metal in the wires is sizeable, and the wires are being kept "hot" to discourage vandalism and theft on sections the salvage crews have not yet reached.

Ironically, the Milwaukee Road's announcement of the end of its electrification came close in time to announcements by several other railroads that they were seriously considering electrifying portions of their lines.

Superficially this seems to put the Milwaukee in the role of bucking the trend of the future. But realistically, the Milwaukee's phase-out is simply the closing chapter in a different era of railroading. The other electrified operations which existed when the Milwaukee's was built, except for the commuter-oriented Long Island Railroad and the Penn Central's high-density passenger corridors, have been long since dismantled because of difficulties similar to those now facing the Milwaukee Road electrification.

New electrifications with highly advanced technology and sophisticated new equipment may well lie ahead for some railroads whose economics and traffic patterns justify the enormous investment.

But for the Milwaukee Road, its electrification is part of the past for which economic justification can no longer be made.

The Milwaukee's electrification, beloved by generations of railroaders, railfans and travelers, will be missed. It has long been a proud part of the railroad's heritage, and its demise will leave a void. But the stories, the lore and the memories will live on long after the last trolley wire is carted off for scrap and the last boxcab shell is broken up.

The electrification has done its job and done it well, and now the job is over. The concession to progress is being made quietly and with dignity.

Those who have been concerned about the fate of the Milwaukee Road electrification in recent years can rest easy.

Its niche in history is secure. ■

Prepared by the Public Relations Department of the Chicago, Milwaukee, St. Paul and Pacific Railroad Company as a special supplement to the July-August 1973 issue of The Milwaukee Road Magazine.

THE MILWAUKEE ROAD

Written by
RODNEY A. CLARK, Assistant Manager-Public Information

Edited by
JOHN J. FELL, JR., Editor, The Milwaukee Road Magazine

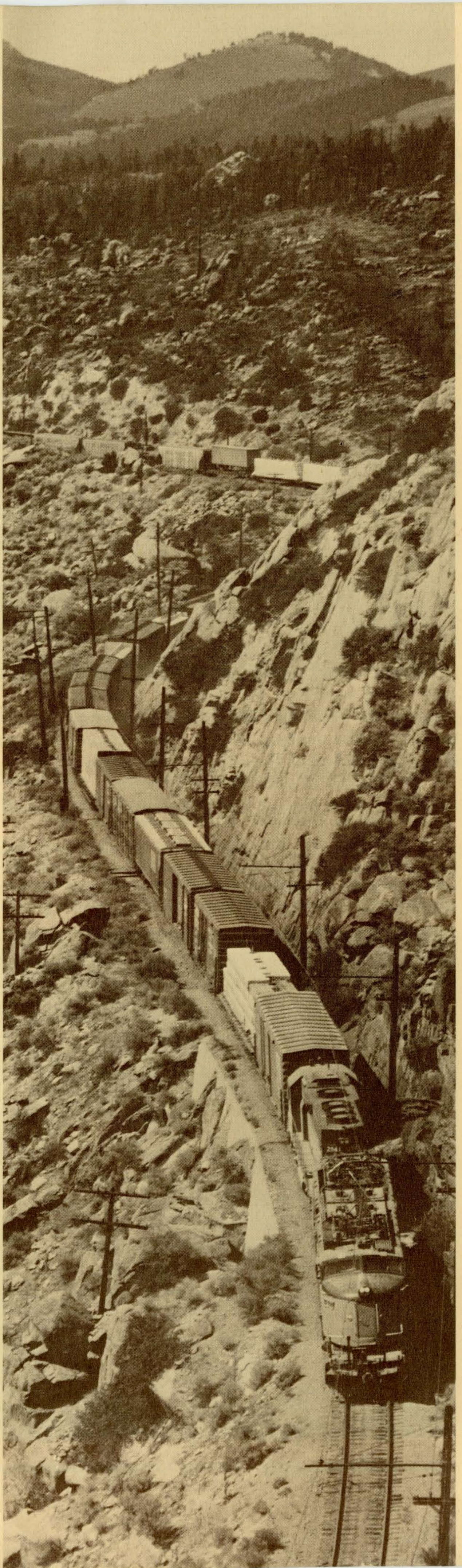


Photo by Tom Brown, 1971.