



THE  
MILWAUKEE  
ROAD



# Milwaukee Electrics

FIFTY YEARS GONE

DICK DORN/PHOTOS BY THE AUTHOR

**T**HE MILWAUKEE ROAD had the distinction of building and operating the longest main line heavy electric railroad in the U.S. For more than 50 years, brutish electric locomotives hauled trains over five mountain passes in the Pacific Northwest on what was called the Pacific Extension. Starting in 1917, a variety of locomotives were utilized with General Electric being the dominant builder. This unique and often remote operation gained many fans over

the years, and still does to this day, even though the wires were de-energized for good on June 15, 1974.

What would become the mighty Milwaukee Road began as Milwaukee & Mississippi Railroad on February 25, 1851, between Waukesha and Milwaukee, Wis., as the Badger State's first railroad. As time progressed, the system grew through building new lines and acquiring other railroads. On February 11, 1874, the railroad took on a new name

— Chicago, Milwaukee & St. Paul Railway — and by 1900 operated more than 6,000 miles of track. By all accounts, it was a prosperous Midwestern railroad well-positioned for growth.

At the same time, the Pacific Northwest was dominated by Union Pacific, Northern Pacific, and Great Northern, which all had lines reaching from the Midwest to the Pacific Coast. Milwaukee Road management decided that the railroad's future was not secure with its dependence on bridge traffic from UP, NP, and GN; the only answer was to build its own line to the Pacific. Construction began in 1906 on a line from Mobridge, S.D., to Tacoma, Wash., a distance of 1,440 miles. The line would be shorter and hopefully faster than its three

**OPPOSITE:** Milwaukee Road Train 263 is climbing the grade up to Pipestone Pass with the final westbound electric-powered train. Little Joes E-74 and E-71 are doing the honors on June 14, 1974.

**ABOVE:** About three miles railroad east of Deer Lodge, Mont., Joe E-77 leads Train 263 west under the watchful eye of Electric Peak, part of the Boulder Mountains, on June 10, 1974. The train will stop at Deer Lodge for a crew change. Burlington Northern's former Northern Pacific tracks are in the foreground.



**ABOVE:** Substation Number 10 at Primrose, Mont., sees the passing of Train 264 on June 13, 1974. Single Joe E-72 leads a four-unit set of diesels including two SD45s and a pair of GP40s.

**RIGHT:** Deep in Jefferson River Canyon, Train 264 skirts the river on June 9, 1974. The photographer is standing along the former Northern Pacific tracks (then Burlington Northern) on the opposite side of the river.

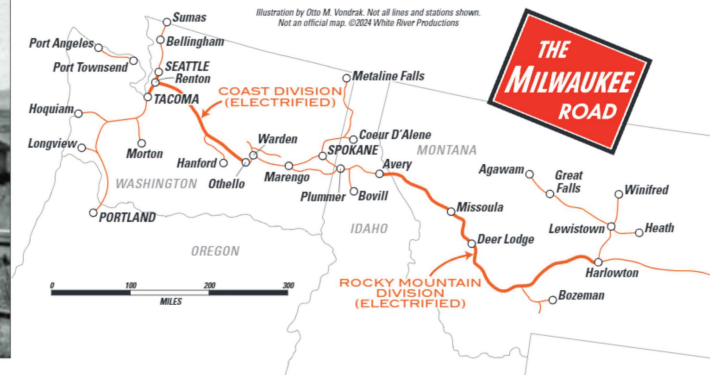


locomotives built using high-voltage d.c. regenerative braking. The advantage was that as the trains were going down-grade, they could use the regenerative braking to generate electricity to put back into the system while helping to maintain track speed.

On September 25, 1915, the first locomotive (boxcab set 10200A-B) was delivered, billed as “the largest electric

locomotive in the world.” To justify the cost of electrification, the railroad performed a test east out of Butte, Mont., up the 1.66 percent grade to the summit of Pipestone Pass. A 3,000-ton train with a two-unit boxcab on the point and a second boxcab as helper was able to maintain a constant 16 mph. A 2,000-ton steam freight followed with two 2-8-2s on the head end and a 2-6-6-2 helper; it was

## Milwaukee Road's Electric Lines



competitors. The Pacific Coast Extension was completed on May 14, 1909, without the use of any federal land grants. Purchasing rights-of-way across private land added considerable cost to the railroad. The original estimated construction cost was \$45 million, though that was exceeded by more than \$200 million when the cost of electrification was included. The railroad was soon renamed Chicago, Milwaukee, St. Paul & Pacific, reflecting its expanded transcontinental reach.

The extension began operations as a low-density single-track main line. There were short sections of both automatic and manual block signals, both with train orders instituted along with a “staff” system on a mountain-grade segment. Train orders were also used on the unsignaled “dark” territories, while upper-quadrant semaphores were installed elsewhere. In 1917 the railroad began upgrading parts of the automatic block signal (ABS) system with three-color signals. Within three decades it extended to more than 1,356 of the entire 1,440 miles, with train orders still used to dictate train movements.

As soon as the new extension opened for business, management began exploring the implementation of electric traction in the mountainous areas of Montana, Idaho, and Washington. Feasibility studies with General Electric

began in 1913, and the following year, Milwaukee Road signed a contract for a package deal that included locomotives and the necessary infrastructure to operate the high-voltage d.c. electrification, including power distribution to the catenary and 14 substations. That year, construction began on the Rocky Mountain Division electrification from Harlowton, Mont., to Avery, Idaho, a total of 440 miles. Substations were located approximately every 35 miles in the flatter areas and 25 miles in the mountainous terrain. All construction was completed in 1917 at a cost of \$12 million.

General Electric would provide 12 60-mph two-unit passenger locomotives and 30 two-unit 35-mph freight locomotives rated at 3,340 hp as part of the deal. Both were designed to operate under Milwaukee’s chosen 3,000-volt d.c. catenary system. These were the first-ever electric

able to only make 9 mph up the hill. This demonstration sealed the deal for management as justification for its decision to electrify. Electrification was soon extended to include the Coast Division, covering 208 miles between Tacoma and Othello, Wash., with the installation completed in 1920.

With the electrification of both the Coast and Rocky Mountain divisions there were now 648 miles of main track under wires crossing both the Cascade and Rocky mountains. There were five mountain ranges that had to be

**RIGHT:** At the east end of the Deer Lodge yard, steeple cab E-82 switches as the westbound BN local rumbles past heading for Missoula, Mont., with a pair of Geeps on the head end on June 14, 1974.

**BELOW:** Train 264 with Joes E-72 and E-74 descends the 2 percent grade on the east side of Pipestone Pass on June 9, 1974. The Joes are in regenerative power mode and diesel 2058 is in full dynamic.



**TOP:** The late afternoon sun flashes off the flanks of Joes E-72 and E-74 as they lead Train 264 east along the Jefferson River at Jefferson Island, Mont., on June 9, 1974.

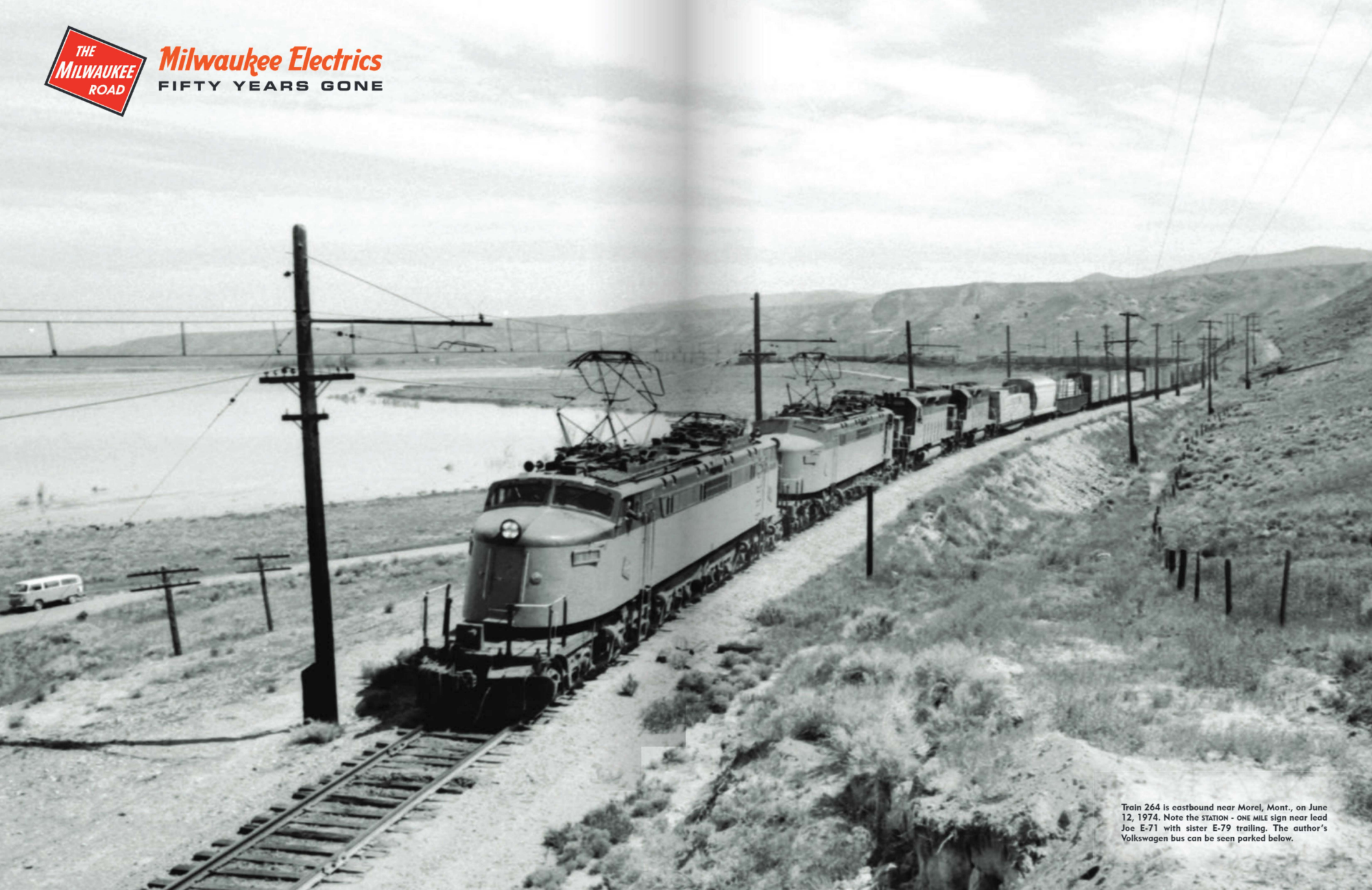
**ABOVE:** The final electric-powered train eases through the Deer Lodge yard and past four stored Joes on June 15, 1974.

and the 18-mile climb from Beverly on the east side with a 2.2 percent grade — the railroad's steepest. On the Rocky Mountain Division, mostly in Montana, the Bitterroot Mountains had a 22-mile climb out of Avery into Montana at East Portal on the west side and a 14-mile climb from Haugen to East Portal. Over on the Rocky Mountains, the west side climb from Butte to Pipestone Pass was 15 miles reaching an elevation of 6,347 feet, the highest point on the railroad; the opposite side featured a 21-mile ascent from Piedmont to the summit. The Belt Mountains had a gradual 48-mile

conquered by electric-powered trains. On the Coast Division in Washington, there was the 22-mile climb up the Cascade Mountains from Cedar Falls to Hyak at Snoqualmie Pass. Next were the Saddle Mountains with a 10-mile climb from Kittitas up to Boylston on the west side,

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Train 264 is eastbound near Moret, Mont., on June 12, 1974. Note the STATION - ONE MILE sign near lead Joe E-71 with sister E-79 trailing. The author's Volkswagen bus can be seen parked below.



**ABOVE:** Shortly after midnight on June 15, 1974, the final electric-powered train sits in the yard at Alberton, Mont., waiting for a rested crew. Little Joes E-73 and E-20 will lead the train to Deer Lodge.

**RIGHT:** On the evening of June 15, 1974, a trio of Joes — E-72, E-20, and E-79 — occupies the Deer Lodge roundhouse. On the adjacent track with the door closed is an electric rotary snowplow.

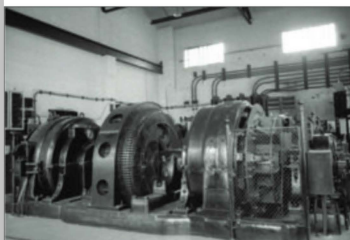
climb from Lombard to Loweth on the west side and another 10-mile climb from Lenep to Loweth.

Excepting the Belt Mountains, the other four passes normally required helpers. These passes are where the electrics really shined. They saved millions of dollars every year over conventional steam operation and required fewer locomotives to get the trains over the mountains. In addition, the electrics did not require frequent stops for water or fuel and required far less maintenance than steam locomotives. In the early 1930s, The Milwaukee Road concluded that it would be more advantageous to set up the boxcars in sets of three units instead of two as they were running heavier trains, helping eliminate one train crew. Even heavier trains resulted in the development of four-unit box motor sets in 1951.

With the opening of the Coast Division electrification in 1920 there was

an immediate need for more power. The Milwaukee Road decided to order additional passenger power in the form of 15 GE Bipolar units, but the U.S. Railroad Administration — briefly tasked with overseeing the nation's railways during World War I — only allowed five and substituted 10 Westinghouse quill-drive units rated at 3,396 hp and a whopping 88 feet long. A single Westinghouse motor would be able to handle almost all passenger assignments, allowing the Milwaukee to re-gear the 12 passenger boxcars for freight service. The units were loved by the train crews due to their power and smooth riding. They were not well-received by the maintenance departments, as they had constant issues and were hard on the track structure.

The GE bipolars were touted as the



locomotives that would usher in electrification of main line railroading throughout the U.S. They were unique in that there were no gears in the trucks, and the armature was mounted on the axle. They were a rather handsome engine and well-liked by train crews and did not have the maintenance issues the quill motors had. At 3,180 hp, they were powerful enough for a single unit to handle almost all passenger trains but were not capable of working in multiple with another unit.

The railroad purchased two steeplecab switchers from General Electric in 1915, followed by two more in 1917. They were primarily used to switch the yards in Deer Lodge and Butte. With the center steeplecab, they had excellent visibility in all directions and were well-liked by the crews. All the yards and customer sidings in Deer Lodge and Butte were electrified, making the 542-hp switchers ideal for work there.

The final electric locomotives purchased were the GE "Little Joes," nicknamed after Soviet leader Joseph Stalin. They were built in 1948 for use in Russia, but shortly thereafter relations with the U.S. soured and turned into the Cold War and the motors never left the States. In 1949, Milwaukee Road tested one for a

three-month period and then returned it to General Electric. There were 20 units built, with five purchased by Brazil and a trio acquired by Chicago South Shore & South Bend. In 1950 the Korean War began, and The Milwaukee Road saw a significant increase in traffic. It was desperate for new power, with diesels on order but not yet delivered. The railroad was able to strike a deal with GE for the remaining 12 Little Joes. Two units were set up for passenger service and the other 10 for freight. Once in operation, they were found to be powerful — rated at 5,110 continuous hp — and rugged, and were known for their excellent performance.

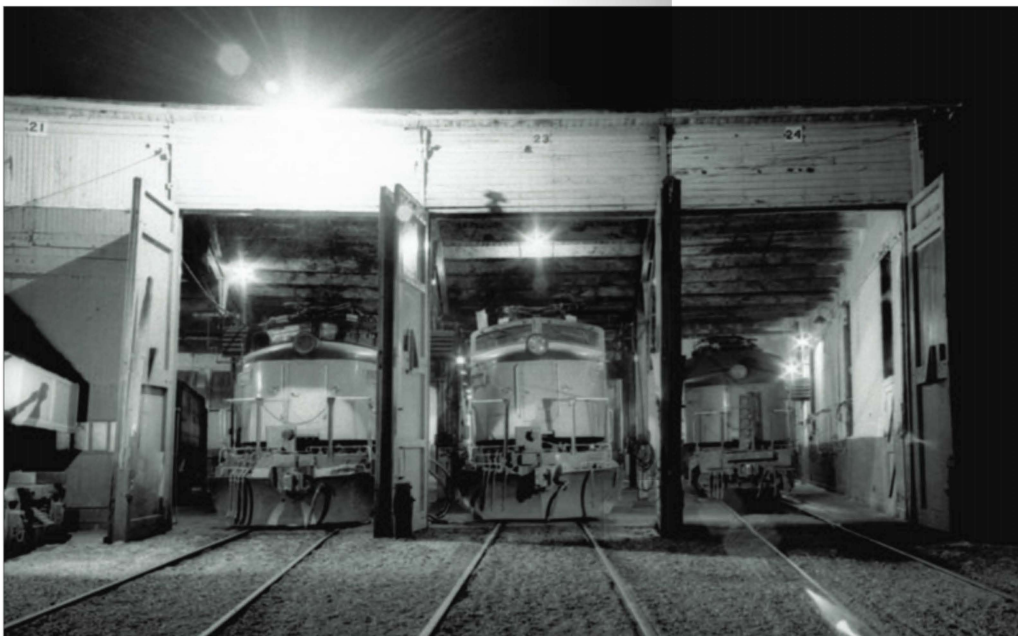
Soon the economic downturn of the 1970s, coupled with the consolidation of traffic on the newly formed Burlington Northern, would catch up with The Milwaukee Road. The last electric operations on the Coast Division were on November 13, 1972. In summer 1973, management decided it was too costly to upgrade the infrastructure and electric operations were suspended west of Deer Lodge. That all changed in October when the Arab oil embargo began, and diesel fuel costs soared. The electrification west of Deer Lodge was quickly put back in service, but the writing was already on the wall; seven months later, the end came on June 15, 1974.

#### A Whirlwind Tour

In 1974 I was teaching elementary school in Yuba City, Calif., and I was well aware of the end date for the Milwaukee electrics. The last day of school was June 7, and I went to work that day with my trusty 1971 Volkswagen bus loaded up with camping supplies and a bag full of black & white film. My good friend Ted Benson had just visited the

**ABOVE LEFT:** It is eerily quiet inside Substation Number 8 at Gold Creek, Mont., on June 17, 1974, as a trio of electrical generators has been silenced forever after 58 years of providing the electric white lightning that powered Milwaukee electrification.

**BELOW:** After cresting the summit of the Belt Mountains, Train 264 is descending the 1.4 percent grade snaking through the S-curve at Loweth, Mont., on June 10, 1974.





**ABOVE:** Just before sunset, boxcars E-57B and E-34C, the regular Harlowton, Mont., yard switchers, work the west end of the yard on June 10, 1974. This was the final pair of boxcars working in active service.

electric operations about a month earlier and sent me off with a multiple-page railfan guide for chasing the electrics that was well-used over the next eight days. I departed right after school and drove straight through the night, arriving 13 hours later in Butte on the morning of June 8. What would follow was a mad dash to try to record as many of the electric operations as humanly possible.

Acting on Benson's recommendation, I focused my efforts between Deer Lodge and Harlowton because the railroad was much more accessible in that area. Often, I would drive long distances at night to position myself the next morning in the most advantageous location. With friendly operators in stations, I was able to look at lineups to see where trains would be operating the next day. On several nights, sleep was limited to just a few hours, but at age 27 you can get away with that!

As the end approached, I drove the night of the 13th to Three Forks to be in position for Train 263, the final westbound electric-powered train. It departed for Deer Lodge with Joes E-79 and E-71



**ABOVE:** On June 10, 1974, after running 25 miles from Lenep to Two Dot, Mont., with a defective traction motor on E-77, the engineer and head brakeman on Train 264 poured water on the journal of the smoking motor. This proved futile and the crew are unloading their grips before they set out the Joe.

leading three diesels. I was able to photograph this train in numerous locations, as by now I really knew my way around. As the train approached Sinclair, about eight miles from Deer Lodge, it suffered a major mid-train derailment stacking up 10 to 15 cars. The Joes dropped the pantographs, and the two diesels unceremoniously took the head-end cars that were still intact on to Deer Lodge, arriving late that afternoon.

After my arrival in Deer Lodge and a check with the operator, it was off to Alberton, Mont., for the final electric-powered

train. Arriving in Alberton that evening, Train 264 with Joes E-73 and E-20 plus three diesels was waiting for a rested crew. This allowed time for night shots before its departure at 4:20AM. About eight miles east of Drummond, several railfans were gathered on an old wooden overpass when I saw a Land Rover drive up, and this tall guy stepped out. Somebody whispered, "I think that's Richard Steinheimer," and sure enough, it was.

He had driven straight through from Los Angeles — well over a thousand miles — to catch the last train. This was when I met Stein for the first time, and we would later develop a lasting friendship.

When the train arrived in Deer Lodge, Stein took charge. He got the crew all lined up for photos and then surprisingly had all the railfans line up for a group photo in the same manner. Later that day, I shot the E-82 steeplecab switching

the yard; the crew tied up at 3:40AM Mountain Time, ending electric operations on The Milwaukee Road for good.

Since The Milwaukee Road was the last railroad to the Pacific Northwest, it had difficulty developing a solid lasting traffic base. Had it been able to accomplish that, its electrification might have lasted much longer as the railroad would have been able to invest in rebuilding it. Unfortunately, this was not the case, with traffic steadily declining; the Pacific Extension west of Miles City, Mont., was abandoned in 1980, closing a colorful chapter in western railroad history. ■

*The author thanks Dave Stanley for scanning his negatives. Also many thanks to Art Jacobsen for his tireless efforts to make this article as factually correct as possible.*



**LEFT:** Eastbound Train 264 eases through the reverse curves at Morel on June 12, 1974. Joe E-71 and company have 51 cars on the headpin on this day.

**BELOW:** Richard Steinheimer assembled the crew of the last electric-powered train, resulting in a nice portrait marking the end of Milwaukee Road electrification on June 15, 1974.

