SPECIAL
Trains

Motive Power Review | New Power Profiles

LOCOMOTIVE 2009

THE MAGAZINE OF TODAY'S MOTIVE POWER

DISPLAY UNTIL DECEMBER 22, 2009

HOW TO MANAGE 6,000 LOCOMOTIVES BNSF-style

Tunnel Motor TRIBUTE

Snowfighting Geeps on Donner Pass

Helpers Battle Horseshoe Curve

Special Feature

ALCO LIVES!

...40 Years After The Fall

$9.95
98
7 25274 46788 4


RJ Corman
RAILPOWER®
A Generation Ahead.
2009
RJ Corman
RAILPOWER
2009
The Best GenSet Technology
Joins The Best Railroad Service Provider.
Pull More For Less
With Our RP Series GenSet Locomotives.
Class Leading Adhesion • Drastic Fuel Savings
Maximized Asset Utilization • EPA Certified Ultra Clean Power
RP14BD - 4 Axle Yard Switch Power
RP20BD - 4 Axle Switch & Branch Line Power
RP20CD - 6 Axle Hump Yard Power
Developed By Railroaders For Railroaders.
877.444.2212 www.rjcorman.com sales@rjcorman.com

Greg McDonnell

LOCOMOTIVE 2009

TRAINS MAGAZINE SPECIAL EDITION NO. 4–2009

EDITOR
Greg McDonnell

ASSOCIATE EDITORS
Jim Wrinn and Kathi Kube

ART DIRECTORS
Chris McCorkindale and Sue Breen

ASSOCIATE ART DIRECTOR
Thomas G. Danneman

DESIGN
McCorkindale Advertising & Design

DIGITAL IMAGE POST-PROCESSING
M. Ross Valentine

EDITORIAL ASSOCIATE
Diane Laska-Swanke

PUBLISHER
Kevin P. Keefe

Locomotive (ISBN 978-0-89024-779-2) is published by Kalmbach Publishing Co., 21027 Crossroads Circle, P.O. Box 1612, Waukesha, WI 53187-1612.

Canada publication mail agreement 40010760

EDITORIAL
Phone: (262) 796-8776
E-mail: editor@trainsmag.com
Fax: (262) 798-6468

DISPLAY ADVERTISING SALES
Phone: (888) 558-1544, ext. 625
E-mail: adsales@trainsmag.com
Fax: (262) 796-0126

CUSTOMER SERVICE
Phone: (800) 533-6644
Outside U.S. and Canada: (262) 796-8776, ext. 421
E-mail: customerservice@kalmbach.com
Fax: (262) 796-1615

RETAIL TRADE ORDERS AND INQUIRIES
Phone: (800) 558-1544, ext. 818
Outside U.S. and Canada: (262) 796-8776, ext. 818

VISIT OUR WEB SITE
www.trainsmag.com

Single copy prices: $8.95 in U.S.; $10.95 in Canada and other foreign countries, payable in U.S. funds drawn on a U.S. bank. Canadian price includes GST. BN 12271 3209 RT. Printed in the U.S.A.

Trains SPECIAL

KALMBACH PUBLISHING CO.

Which Would You Rather Idle?

Stop idling and reduce your fuel bill. With JUNIOR, your prime mover remains shutdown and in a ready-to-start condition...batteries fully charged and engine above 100°F...even in frigid weather.

JUNIOR is a simple, reliable APU that is small enough to easily install on your locomotive. Using an EPA certified, 13hp diesel engine, JUNIOR sips just 1/2GPH of fuel instead of the 4GPH consumed when idling your prime mover. The only big thing about JUNIOR is your fuel savings!

To learn more about JUNIOR and how much fuel you can save, please visit www.kimhotstart.com. From the Markets tab, select Railroad.

"The JUNIOR is uncomplicated and simple to install. What I like best about the JUNIOR is we don't need to train the crew on how to operate them. At the end of a shift, you shut the locomotive down and the JUNIOR starts right up."

Jake Jacobsen
Locomotive Maintenance, Lehigh Valley Rail
Bethlehem, Pennsylvania

HOTSTART®
SINCE 1942

www.kimhotstart.com 509-536-8660

LOCOMOTIVE 2009

David Styffe

CONTENTS

On the Cover: Power plays. Led by BNSF ES44DC 7491, Chicago-bound intermodal train Z-LACKCK9-18 charges up Cajon Pass with power to spare on Feb. 18, 2009. Photo by Greg McDonnell
At left, BNSF 4642, 1039, 5410 and 998 eastbound at East Ash Hill, 6:36 p.m. on June 19, 2009.

LOCOMOTIVE 2009

Greg McDonnell

CONTENTS

Control stand, Delaware-Lackawanna RS3 4068

Still a study in superlatives

There's a tattered and taped copy of the April 1957 issue of TRAINS magazine before me on the desk as I type this. Fifty-two years after the magazine rolled off Al Kalmbach's press, with a misty-night Philip R. Hastings photograph of Pennsy's AR tower on its cover, and the promise of "15 pages of Mountain Railroading" on the inside, the issue's feature story on the Pennsylvania Railroad's Altoona-Pittsburgh main line remains relevant.

With railroad photojournalism at its finest (what else would you expect from the inimitable pairing of then-Editor David P. Morgan and photographer Hastings), "World's busiest mountain railroad" offers an invaluable perspective: a rich sense of history and a deep understanding of the legendary mountain main "strung across the mountains and ridges between Altoona and Pittsburgh" more than 150 years ago by J. Edgar Thomson, the original chief engineer of the PRR. The piece should be a prerequisite read before setting foot on that same piece of railroad, now part of Norfolk Southern's Pittsburgh Line.

Michael Valentine did just that before checking into the Station Inn in Cresson, Pa., on a six-day assignment to cover the Altoona helpers for this magazine. From just yards off the porch in Cresson to the bustling yard office at Rose Yard to Alto Tower and Horseshoe, MG, Benny, and Gallitzin ... and to a dark stretch of main line west of Lilly illuminated only by the yellow glow of Union Switch & Signal position-light signals and a helper's headlight, he found a high-density, multiple-track mountain railroad as magnificent as when Morgan and Hastings experienced it in September 1956.

"A study in superlatives," Morgan wrote. The Pittsburgh Line today is all that and more. Indeed, just a few hours on the Altoona helpers with conductor Dave Glunt and engineer Kenny Snively will pretty much exhaust even the best vocabulary of superlatives.

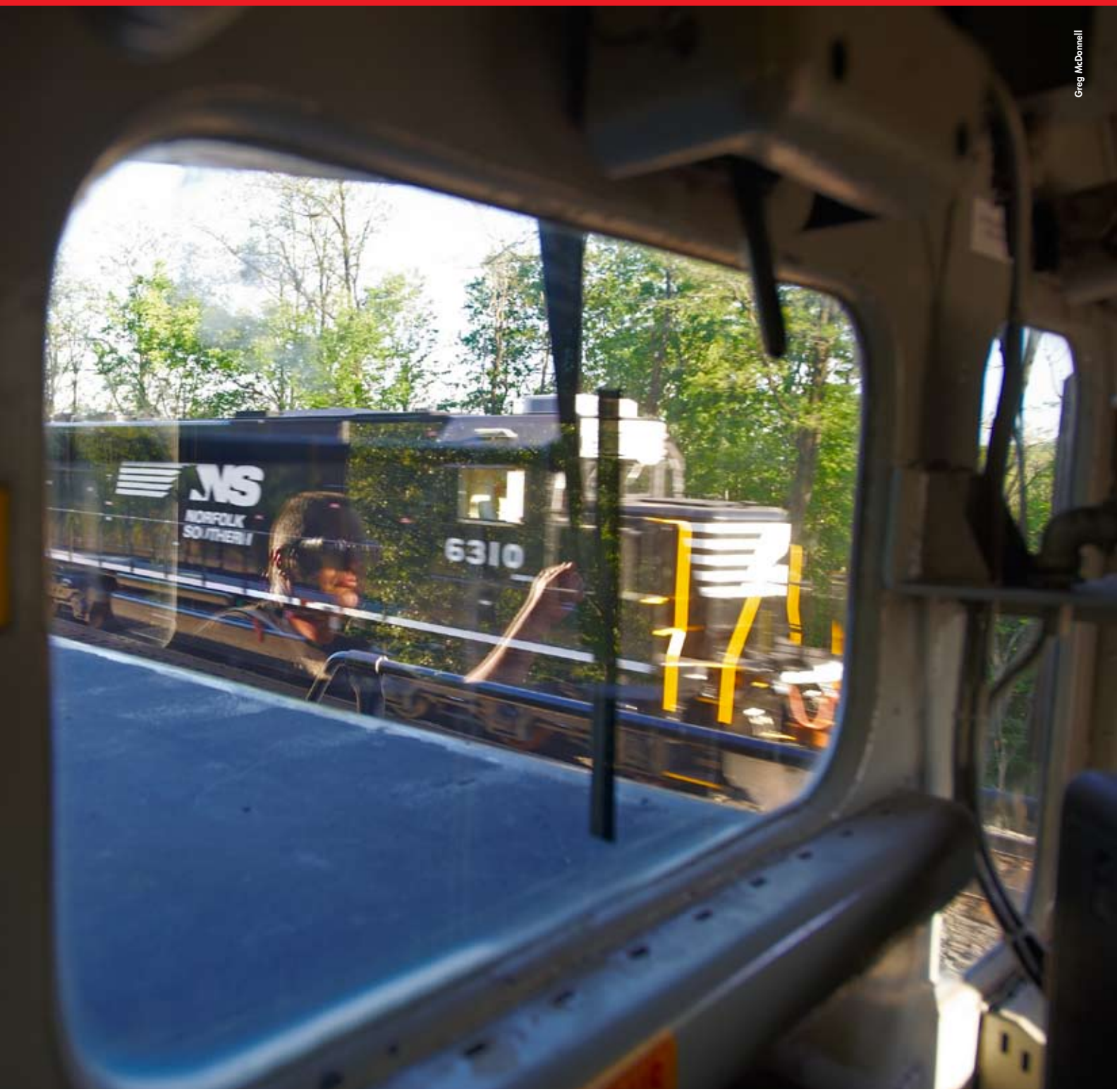
Of all that has changed on this mountain railroad, two of the elemental aspects have not: the drama of heavy-tonnage trains — dozens of them per day waging battle with fabled Allegheny grades — and the unwavering professionalism of the railroaders assigned to get the job done.

In the cab of NS SD40-2 3338, it's played out as Snively and Glunt's paired EMDs, tied to the rear of Elizabethport-Chicago train 23M, shoulder into 6,424 tons of intermodal manifest. The aging machines shudder and shake; 645s bellow out and two miles of interstate commerce move up the storied mountain grade.

Vestiges of the Pennsy reign are in ample evidence, from the position-light signals that beckon 23M uphill, to the ancient but freshly painted wood-frame interlocking tower at Alto, to no less than the most famous railroad landmark in the country: Horsehoe Curve. A worthy successor to "the standard railroad of the world," Norfolk Southern has put its own impressive stamp on this mountain main.

Just west of McGarveys, an eastbound freight slams past the helpers on 23M. Sunlight flashes as trees and train cars blur by. Snively gives the passing train a careful look and a wave as two generations of helpers meet on Scotch Run Curve: Old-school SD40-2s built for Conrail in 1977, and new-generation SD40Es 6310 and 6308.

Reflected in the windshield glass of NS SD40-2 3338, locomotive engineer Kenny Snively gives a wave as two generations of helpers pass on Scotch Run Curve west of Altoona, Pa.



Greg McDonnell

Fresh out of Juniata and a from-the-rails-up rebuild of tired SD50 cores, they're not just any locomotives. In the great Pennsy tradition, they're Altoona-built locomotives.

For a fraction of a second, it all comes together, framed in, and reflected on the windshield glass of NS 3338: man, machine, and mountain railroad.

A study in superlatives, indeed.

Greg McDonnell, Editor

2009 LOCOMOTIVE MOTIVE POWER REVIEW

Hard times, high hopes, and a bold bid to bring back the A1A-A1A locomotive

by Greg McDonnell

Steve Smedley

Alex Ramos

Bound for Bakersfield on March 23, 2009, new A1A-trucked BNSF ES44C4s race an eastbound manifest through California's Central Valley.

Randy Allard

The first EMD ECO710 rebuilds, KCS SD22ECOs 2650 and 2651 stand at East St. Louis, Ill., on June 13, 2009.

LOCOMOTIVE 2009 MOTIVE POWER REVIEW

Jeff Robertson

Domestic orders on EMD's 2009 docket included a 35-unit SD70ACe order for BNSF and 25 SD70M-2s delivered to Canadian National. On Feb. 17, 2009, brand-new CN SD70M-2 8860 and veteran SD40-2 5353 lead a 153-car grain train near English, Alta., on Feb. 17, 2009.

The iconic image of railroading in 2009 must be the rows of stored locomotives that crowd shop tracks and yards from Commerce, Calif., to Cumberland, Md.; Winnipeg, Man., to West Colton, Calif.; North Platte, Neb., to Fort Worth, Texas; and just about anywhere else secure track space is available. Every one of those stored Geeps, SDs, Dash 8s, Dash 9s, and ACs represents not just idled investments, but furloughed railroaders, laid-off autoworkers, closed factories, cold blast furnaces, and shuttered storefronts. North American railroads, carriers of more than 40 percent of intercity freight traffic, have been hit hard by the global economic malaise.

But it's not all bleak. Despite the economic downturn, new and evermore-efficient locomotives continue to roll off the assembly lines, albeit at a dramatically reduced pace. Green initiatives, particularly interest in increasing fuel economy and lowering emissions, are driving new innovations, from Electro-Motive's 710ECO line to Progress Rail Services' push to market Caterpillar-powered locomotives not just in its new genset line, but in road locomotives repowered with CAT diesels. Most surprising, and certainly most controversial, is GE's ES44C4, a bold experiment to bring back the A1A-A1A locomotive. Shades of the Erie-Built!

Indeed, there are those who see opportunity in those rows of dormant diesels. "Now," says GE Transportation CEO Lorenzo Simonelli, "is right time to retire old, less fuel efficient and less eco-friendly locomotive clunkers for good ... and to replace them with fewer, cleaner, state-of-the-art locomotives. Just as the federal government is grappling with legislation to create a "cash for clunkers" program for cars, there should be a similar program for locomotives."

Locomotive builders dig in

The fortunes of locomotive builders turned on a dime. After years of feasting on record sales, the total 2009 output for all builders combined will barely reach what General Electric alone built in 2008. What remains unknown is what impact government stimulus funding or tax breaks might have to could encourage railroads to purchase new power. Earlier incentives and much of the state and local funding aimed at emissions-reduction have all but dried up. Without such funding to subsidize purchases of hybrid and genset switchers, many railroads are expected to expend what capital funds are available for motive

power on mainline locomotives, leaving the switcher fleet to wait out the recession. The timing is especially unfortunate for the half-dozen builders who have launched new products into this limited market.

3,000 EVOs and counting

GE Transportation's Evolution Series locomotives have passed the 3,000-unit mark in domestic deliveries in less than five years of production. Now there's a new addition to the line. Beginning in March, BNSF began taking delivery of 25 prototypes of a new Evolution model, the ES44C4.

At a glance, the ES44C4 looks little different from the thousands of EVOs already on the road; and, except for some subtle differences in the trucks, it isn't. The secret is behind the silvered frames of its HiAd trucks. Or, more correctly, isn't behind them. The A.C. traction ES44C4 has traction motors slung on just four of its six axles, an A1A-A1A configuration more commonly associated with the likes of first-generation passenger diesels, such as EMD E-units, Alco PAs, and, of course, Fairbanks-Morse Erie-Builts.

The genius of the C4 design, and an attribute that sets it apart from all previous A1A-A1A locomotives, is a patented Dynamic Weight Management System that monitors traction performance and automatically redistributes the load from the unpowered center axles onto the powered 1, 3, 4, and 6 axles as adhesion demands warrant. The weight transfer is accomplished with four truck-mounted air cylinders (similar to standard air-brake cylinders) and functions only at low speeds.

GE is wagering that the C4, with four A.C. traction motors and advanced A.C. traction adhesion systems, can not only match the performance of a six-motor D.C. locomotive, but also lower maintenance costs, increase reliability, and extend service intervals. Right out of the gate, the Erie builder was confident enough to promise to convert the C4s to conventional ES44ACs should they fail to meet expectations. BNSF took GE at its word and let the 25 C4 prototypes prove themselves in real-life, make-or-break revenue service. Reports from the road indicate that the A1As have taken everything BNSF can throw at them, from grinding over Marias Pass in a blizzard with 14,000-ton grain trains, to racing 10,000-foot Los Angeles-Chicago stack trains over the Transcon. Validation of the concept will be based on longer-term performance, but the prototypes' early results, having collectively logged more than 5 million miles of service within their first few months on the road, were enough to convince GE to officially add the ES44C4 model to its Evolution Series lineup with a formal product launch at Erie on May 18, 2009.

The C4, fully upgradeable to standard six-motor ES44AC configuration should traffic demands or motive power requirements warrant conversion, is "the platform of the future," says Dave Tucker, GE's vice

Both photos Greg McDonnell

Signs of the times: More than 100 idle Union Pacific EMDs and GEs (at top) stretch to the horizon as ES44ACs 7606 and 7761 roll through West Colton, Calif., with westbound stacks on March 1, 2009. At Commerce, Calif., (lower photo) on March 18, 2009, a westbound piggyback train powered by a quartet of GEs passes more than 135 BNSF Dash 8-40CWs stored in the closed intermodal yard.

Greg McDonnell

Spliced by GE's rolling laboratory car, BNSF ES44C4s 6606, 6603, 6607, and 6602 round Sullivan's Curve in Cajon Pass with an 8,000-foot Long Beach-Chicago stack train on March 25, 2009.

president of global sales. A flexible, fuel-efficient locomotive that can be readily transformed from 4-motor to 6-motor configuration is, Tucker adds, "a salesman's dream."

Although sales have weakened, GE is expected to deliver some 500 EVOs to North American customers in 2009. To help counterbalance natural cycles in the domestic economy, GE has remained true to its "Universal" roots and promoted its products in the international market. In addition to selling older designs to a variety of customers, it has developed new Evolution Series models designed specifically for export. New GE locomotives are now operating in China, plying routes in Australia, Brazil, Egypt, and Kazakhstan, and soon in Britain. In mid-2008, GE startled the competition announcing an order for 30 lightweight A.C. traction locomotives for Britain's Freightliner, a direct assault on Electro-Motive's highly successful JT42 "Class 66" and Euro 4000 products. Nevertheless, harsh economic times have seen production at Erie drop 40 percent from 2008 figures, and forced the Erie plant to lay off more than 1,200 workers.

Exports keep EMD above water

Electro-Motive, too, has hit hard times. For years, EMD's locomotive orders have vastly outstripped the 300-plus units-per-year capacity of its small London, Ont., plant, forcing the company to outsource assembly to Bombardier's shop in Concarril, Mexico, as well as several U.S. shops. In 2009, London was not only able to handle all EMD orders for new locomotives, but was forced to lay off hundreds of production employees.

In early 2009, EMD delivered 25 SD70M-2s to Canadian National and 35 SD70ACe locomotives to BNSF. Export orders have pulled London through more than a few lean years, and this one is no exception, as production includes several orders for JT42CW-models, including 40 for Egypt, a dozen or so for France's Euro CargoRail, and a new order for CrossRail Benelux in Belgium, as well as nine SD70ACe units for Australian ore hauler Broken Hill Proprietary. Hitting back at its competitor across Lake Erie, EMD has reportedly begun designs for a dual-cab, A.C. traction European locomotive to compete with GE's latest offerings. A prototype locomotive is expected by 2010.

EMD has also moved into the re-powering market. In 2008, the builder created two demonstrator locomotives for its ECO710 program. Contract shops transformed a Canadian Pacific GP9 and a Kansas City Southern GP38 into ECO demonstrators equipped with a Tier-2-compliant 710ECO engine, new support systems, and an EM2000 microprocessor. Aimed at competing with the genset market, the EMD program will rebuild 4- and 6-motor locomotives with new (but familiar) technology, offering both a 2,150-hp 8-cylinder 710 and a 3,150-hp 12-cylinder prime mover.

In early 2009, 16 KCS locomotives, including 10 GP40s, four GP38s, and two SD40s, were delivered to MotivePower in Boise, Idaho, and Metro East in East St. Louis, Ill., for an ECO makeover as part of the pro-

gram's first order. Additional units, including two rare SDP40s, arrived at EMD in London in early February as part of the same project. Given the thousands of second-generation EMDs still in existence, the ECO program may prove a viable alternative to go green with the familiar 710 engine family and EMD technology. Until recently, sales of 4-axle freight locomotives in general and switchers in particular were all but nonexistent. Government funding aimed at emissions reduction in major metropolitan areas prompted a revival of the yard engine/road-switcher locomotive, and a handful of new and familiar names have jumped in to capitalize on this long-ignored market segment.

Railpower revival

One of the earliest players was Railpower Technologies. Following the delivery of a prototype in 2001, the company produced approximately 60 Green Goat hybrid switchers. While the hybrids received extensive press coverage, a rash of problems soured railroad interest, and Railpower shifted toward the promising genset switcher market. Using contract shops, Railpower has delivered approximately 120 gensets in three configurations since mid-2006.

In 2008, Railpower announced plans to open its own locomotive assembly plant southeast of Montreal in St-Jean-sur-Richelieu, Que. However, the plans were put on hold when the company, plagued by Green Goat recalls, internal personnel changes, and a rapidly contracting market, filed for bankruptcy protection in February 2009. In May, Railpower announced that a deal had been struck to sell most of its assets, excluding the Quebec property and two locomotives, to Kentucky-based R.J. Corman.

National Railway Equipment, long a name in the contract overhaul, repair, and upgrade market, has grown to become one of the largest independent players in the industry. NRE operates three Illinois shops, located at Silvis, Mt. Vernon, and Dixmoor, as well as the former VMV shop in the famed Illinois Central complex in Paducah, Ky. The company also maintains a large lease fleet and has an inventory of hundreds of retired EMD, GE, and Alco locomotives available for rebuild, or as cores for upgrade programs.

Randy Allard

EMD goes ECO. One of the first 710ECO rebuilds completed, KCSM SD22ECO 2650 poses outside the Metro East shop in the company of LLPX 2003, a lease fleet GP38.

NRE's N-ViroMotive series of genset locomotives has proven to be a huge success. Based on Cummins QSK-19 engine technology, the line includes 700-, 1,400-, and 2,100-hp models in 4- and 6-axle versions. While the genset package can be applied to older locomotives, most have been all-new locomotives. The locomotive control system is proprietary, featuring per-axle traction control, something not typically found on D.C. locomotives.

The 4-axle, triple-genset 3GS21B has proven most popular: BNSF has taken delivery of 73, UP has 60, and NS, CSX, CP, and several short lines and industrial customers have purchased smaller quantities. To date, the 6-axle 3GS21C has found two buyers: Pacific Harbor Lines with two, and a single unit delivered to Norfolk Southern. By early 2009, NRE had delivered more than 175 gensets with additional orders pending.

Following the bigger locomotive builders, NRE has also gone global with its E-Series export road-switchers. Offered as new or remanufactured, the first models of this design were delivered to Magadi Soda in Kenya in early 2007. A long way from its rebuilder roots, NRE has become a formidable player in the medium-horsepower locomotive market.

Doyle Massey

Fresh from the paint booth in July 2009, GG20B demonstrator 1701 displays the corporate colors of RailPower's new parent, R.J. Corman.

Steve Smedley

One of two 4,000-hp, Caterpillar-engined PR43Cs ordered by Norfolk Southern, NS 4001 departs Normal, Ill., on June 9, 2009, testing in the company of SD60 6644 and Conrail-painted Dash 8-40CW 8442.

Progress Rail Services, a longtime industry supplier of engineering and track services, railcar builder and rebuilder, with locomotive and car repair shops throughout North America, has expanded its presence in the locomotive arena since its acquisition by Caterpillar in 2007. Progress has fielded a number of demonstrator units using EMD cores rehabilitated with Caterpillar engines and advanced control systems. The firm has also established a new shop at Mayfield, Ky., and introduced its own genset switcher, the PR22B. Powered by a trio of Caterpillar C18 engines, the 2,235-hp PR22 made its formal debut at the Railway Supply Institute exhibition at Chicago in September 2008.

Even more significantly, Progress has quietly moved into the road locomotive market. The Mayfield shop has produced a pair of 4,000-hp, Caterpillar-powered PR43Cs for Norfolk Southern, using two retired SD50s as core locomotives. In spring 2009, Union Pacific began testing an SD40-2 rebuilt by Progress with a 3,005-hp, low-emission Caterpillar 3516C-HD engine. Caterpillar has long vied for a piece of the road-haul locomotive market and previous Caterpillar repowerings, including Burlington Northern SD40 6330, BN and Soo Line Geeps, and CP M636 4711, failed to gain wide acceptance. Progress is betting that this time it's for real.

Brookville thinks big

Brookville Equipment, a Brookville, Pa.-based manufacturer of mining locomotives and specialty transportation equipment, expanded into larger locomotive designs in 2007 with the release of BL20CG CoGeneration demonstrator BMEX 259, a former Maine Central GP38 upgraded with three Cummins QSK-19 engines and an advanced control system. Since then, Brookville has delivered two-engined BL14CGs to Metro North, as well as 12 HEP-equipped 2,000-hp, MTU-powered BL20GH locomotives to Metro-North and Connecticut DOT and four BL20Gs to New York MTA's Staten Island Railway. Brookville is currently collaborating with Norfolk Southern and Pennsylvania State University on development of an experimental zero-emission, battery-powered hybrid.

Powered by 1,080 "Group 31" off-the-shelf truck batteries configured in 20 parallel strings with 54 batteries each, the high-tech, 1,350-hp experimental is under construction at Norfolk Southern's Juniata Locomotive shop using a retired GP38 as the core locomotive. Brookville also continues to build a wide variety of smaller mining locomotives, a product line it has produced for decades.

MotivePower, a Wabtec company, has established itself as the leader in commuter locomotive sales with MPXpress locomotives. The futuristic-looking Boise-built 4-axle units have become the new standard in commuter power. Since the first MP36 locomotives were delivered to Chicago's Metra in 2003, the shop has secured MP36 and MP40 orders from at least eight more operators, including Caltrain, MARC, Metrolink, and Ontario's GO Transit. In early 2009, MotivePower announced that

GO Transit would be exercising its option order for 20 additional MP40PH-3C units, enabling GO to replace much of its F59PH fleet. In recent years, MotivePower has enjoyed a near-exclusive hold on the passenger diesel market, and by early 2010, MPXpress models will account for more than 25 percent of North American commuter locomotives.

MotivePower has also made overtures in the switcher market. Its MP21B genset demonstrator continues on a nationwide tour, and the company is working on an order for 28 dual-cab, dual-mode A.C. switchers designed for use on New York City Transit.

So, what happened to the horsepower race?

Just a decade ago, they were the hottest things on rails: the A.C. traction, 6,000-hp AC6000CW, SD90MAC-H, and SD90MAC-H II behemoths rushed to market by GE and EMD at the height of the horsepower race. Now, UP SD90MAC-H IIs, locomotives with less than 10 years of service, are gathering in the back lot of an East St. Louis, Ill., shop to be stripped of reusable components and cut up for scrap. More fortunate members of their class have been returned to EMD and find what work they can as lease locomotives. Others have been stored for years. Canadian Pacific's four SD90MAC-H locomotives, in and out of service for all of their short and checkered careers, have been retired and put up for sale. GE's 6000s have fared somewhat better, but UP and CSX, the sole domestic purchasers of AC6000CWs, are both engaged in programs to re-engine their 6,000-hp ACs.

So, what happened?

Looking for a locomotive to power ever-longer and heavier intermodal trains, Union Pacific helped spur EMD and GE on a Quixotic quest for a 6,000-hp, single-engine A.C. traction locomotive: the ultimate machine for high-speed freight. So anxious were both builders to launch the product that 6,000-hp models were cataloged before the technology was perfected. To bridge the gap, "convertible" locomotives were

Greg McDonnell

A collaborative effort of Brookville Equipment, Norfolk Southern and Pennsylvania State University, experimental 1,350-hp, zero-emission, battery-powered hybrid locomotive NS 999, takes shape at the NS Juniata Locomotive Shop in May 2009.

catalogued: AC6000CWs and SD90MACs built with stock 4,400 and 4,300 prime movers and the promise of a 6,000-hp engine transplant when the time came. UP amassed a fleet of 309 710-engined SD90MAC convertibles, and 106 upgradeable GEs, which it classed C6044ACs. Rounding out the convertible fleet were 61 SD90MACs delivered to CP and 40 for the CEFX lease fleet operated by CIT Financial. None of the 517 convertibles sold were ever upgraded.

Production-model 6,000-hp locomotives, GE's HDL-powered AC6000CW and EMD's 265H-engined SD90MAC-H, began rolling off the assembly lines in 1995-'96. Production was limited: EMD built just 22 SD90MAC-H units and 46 successor-model SD90MAC-H IIs. Union Pacific took the lion's share, with 20 originals and 40 'H IIs. Canadian Pacific scaled back a much larger order to just four SD90MACH-IIs. EMD SD90MAC-H II testbeds GM90 and GM91 were the only others built. General Electric, perhaps to its chagrin, more than doubled EMD's stake, building 207 HDL-engined AC6000CWs: 80 for UP, 117 for CSX, eight for Australia's BHP, and two for its own test fleet.

Even before they hit the road, the 6000s were trouble. Problems with both the HDL and 265H were compounded by complex control systems. Unique engine and control systems parts and applications added difficulty to maintenance. Despite efforts by GE and EMD, the 6,000-hp units quickly fell from grace. Try as they might, the high-horsepower freighters achieved neither the desired unit reduction nor the reliability necessary to make single-unit operation practical.

Union Pacific's 21 remaining 265-engined '90MACs have been stored for years, while the rest were returned to the builder. A fortunate few have found work as EMLX lease locomotives. Still others are being harvested of salvageable components and scrapped. In an ironic twist, UP's HDL-engined AC6000CWs are becoming reverse-convertibles as they are being systematically shopped and outfitted with 16-cylinder, 4,400-hp FDL engines making them mechanically compatible with UP's hundreds of AC4400CWs.

Randy Allard

How the mighty have fallen. Retired after less than a decade of service, 6,000-hp Union Pacific SD90MAC-H 8926 and sisters are salvaged for reusable components and scrapped at East St. Louis, Ill., in April 2009.

For most of their careers, the CSX AC6000CWs held down premier assignments in intermodal service, often working in pairs. Heavy usage in this high-speed, high-horsepower environment pushed the HDL engine to its limits. GE and CSX engaged in ongoing programs in an effort to keep the units at desired reliability levels. The search for a fix included temporarily de-rating the units while GE devised engine modifications, and outfitting CSX 699 with a standard 16-FDL engine to test the feasibility of simply re-engining the lot. All but No. 699 were restored to their intended 6,000-hp rating, but the search for a permanent remedy continued, even as new ES44DCs bumped the big units from their hottest assignments.

In 2008, GE and CSX found a workable solution. All 117 units are trading their HDLs for new 6,000-hp Evolution Series GEVO-16 engines and the latest control systems.

CSX currently stands as the sole North American railroad committed to 6,000-hp diesels, and some observers have declared the horsepower race dead. But new ES58ACi built for Vale-Carajas in Brazil began rolling off the shop floor in Erie this spring, and China's Ministry of Rail is taking delivery of 600 EMD- and GE-designed 6,000-hp locomotives in contracts split evenly between the two builders. The locomotives are being built in China, but their influence may be felt on this side of the Pacific. The GEs will employ Evolution Series technology, while the EMD units will be powered by the four-stroke cycle 265H engine introduced in the SD90s. EMD has indicated that it has no domestic plans for the 265H, but as Yogi Bera would say, "it ain't over 'til it's over." 1

Helping keep the horsepower race running, are 10 1600mm-gauge ES58ACi exports destined for ore-hauler Vale-Carajas in Brazil. Vale 2001 poses at GE in Erie, Pa.

GE Transportation

Rail Holiday Cards, Books, Trains and Gifts

A Few of Nearly 200 Holiday Cards Available at www.Railmode.com

CNW Special at Belle Fourche
The fall western inspection trip for CNW officials hit the season's first winter storm and now rests at Belle Fourche, SD, on a cold November morning. CNW's main traffic was clay mined just across the border at Colony, Wyoming. After UP took ownership of the CNW, the line was sold to the Dakota, Minnesota and Eastern, which was subsequently sold to Canadian Pacific.

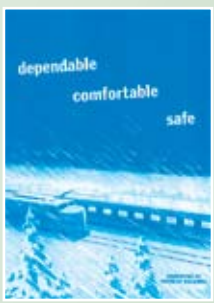
Winter Operations on the Monon
Monon president John Barriger commissioned artist Howard Fogg to portray operations along the 100% dieselized Monon in the late 1940s. Fogg envisioned portraits showing people of the railroad. Note the brakeman giving the highball to the engineer, the trainmaster walking along the inbound train, and the M of W worker with snow shovel in hand.

Riding Up the Front Range on the Rio Grande Zephyr
The Rio Grande opted not to become an initial member of Amtrak, and was forced to run the Denver - Salt Lake remnant of the California Zephyr three times a week. It operated in daylight, which allowed viewing of magnificent scenery over the Rockies and Wasatch mountains. Here, shortly after leaving Denver in 1983, we're in one of the domes heading up the Front Range.

New Passenger Power for the Burlington
This General Motors/EMD advertisement shows one of the Burlington's six new E9 passenger locomotives leading a "Q" streamliner through a cold wintry night, no doubt taking folks home for the holidays.

The Silver Charger at West Quincy
The very last of the original shovel nose Zephyr passenger units, No. 9909, the "Silver Charger" rests at West Quincy, Illinois as dawn breaks. The 9909 was used on local Burlington trains 1 and 44, which operated between Burlington, Iowa and St. Louis. On the adjoining track is the nose of the lead unit of the Minneapolis - St. Louis joint Rock Island/ Burlington Zephyr Rocket.

Olympian Hiawatha leaves Chicago
The pride of the Milwaukee road's once great Hiawatha fleet was this Chicago to Seattle/Tacoma Super Dome Olympian Hiawatha, the first train to be equipped with domes between Chicago and the Pacific Northwest. Here, the famed streamliner is rounding the curve out of Chicago Union Station after its 1pm departure, with the Chicago skyline in the background.



Dependable, Comfortable and Safe
The Association of American Railroads sponsored advertisements inviting travelers to ride America's passenger trains, as evidenced by this ad which displayed trains passing on a cold, snowy night. Passengers were warm and comfortable as they sped home for the holidays on the great fleet of the nation's railroads in the early 1950s.

Your Pick of the Pack on the NYC
"This year, make a holiday homecoming your gift." This early 1950s advertisement by the Central invited holiday travelers to take their pick of the Great Steel fleet of streamlined NYC passenger trains, which plied the east and Midwest to "speed them home for the holidays."

Best Wishes from All of Us at Union Pacific Railroad
Almost up to the end of passenger service, the holiday season on board Union Pacific trains was celebrated with special holiday menus such as onboard-prepared turkey, ham and minced meat pies. Christmas matchbooks like this were available in lounge cars. These little extra touches made the UP streamliners a favorite for holiday travelers until the advent of Amtrak.

Great Streamliner Fleet at California Avenue
This early 1940s color photo captures the City of Los Angeles, a CNW E unit, and the City of San Francisco on their layovers, being serviced at CNW's California Avenue, Chicago, passenger yards. CNW operated the UP Streamliner and Overland Route passenger fleet from the turn of the century until 1956.

A Cold, Wintry Day on the C&EI
The Chicago and Eastern Illinois was a Midwestern regional railroad, and its route from Chicago to Evansville, Indiana, provided a key link for freight and passenger trains between Chicago and the south. This EMD advertisement of the mid 1950s shows two new F units handling a manifest freight with ease along the C&EI main on a cold wintry day.

Golden Hours on the Golden State
The Rock Island and Southern Pacific Railroads operated a premier Chicago to Los Angeles train, the Golden State Limited, which ran through Kansas City and then through Arizona on the famed SP "Sunset Route." The train offered coach, lounge and dining car service. This early 1950s advertisement shows folks enjoying a card game in the Golden State's fine lounge car.

Visit www.Railmode.com for hundreds of card designs, featuring historic advertisements and rail photos. All cards measure 5 1/2" x 8 1/2", with holiday greeting and message about card inside. Mix and match as you like, with a minimum of five cards per design. May be personalized for small additional charge. 5 to 10 cards, 90 cents each; 11 to 20, 85 cents each; 21 and over, 79 cents each. For orders over 75, call 888-489-2324 for special pricing. All cards include envelopes. (Special 4" x 6" cards with fixed inside messages for .65 each, including envelopes.)

Model Railroad Products
An extensive inventory of HO, O, and some N gauge model railroad locomotives and cars, featuring Williams-Bachmann O gauge, Bachmann, Atlas, Walthers, Stewart, Athearn, IHC, Branchline, Broadway Limited, Con-Cor and more - all at competitive prices. Hundreds of great railroad books, posters, and various road name HO locomotive desk display sets.

Kromer Caps
George "Stormy" Kromer was a C&NW engineer in Wisconsin around the turn of the 20th Century. His experience in storms and the cold winter weather motivated his design of this functional hat worn by thousands of railroaders, hunters and outdoors people for nearly 100 years.

Classic Movies of the 40's and 50's on DVDs
The Association of American Railroads and many individual lines produced promotional films highlighting railroads of the era. Ride and tour the Wabash Blue Bird, the California Zephyr, the Empire Builder, the Olympian Hiawatha, the Super Chief, plus PRR and NYC passenger and freight trains, all with classic onboard and run-by shots of late steam and early passenger diesels. Also, check our 2009 video, "Railroads - Pulling for an efficient and Competitive America." All are $7.00 or less, plus postage.

Pullman Blankets

Check out our web site at www.railmode.com for a complete list of books, railroadiana, model trains, and cards.

GOHMANN & ASSOCIATES – Railmode, Inc.
www.Railmode.com • rails@railmode.com • Call Toll Free: 888-489-2324
14047 Petronella Drive, Suite 201 • Libertyville, IL 60048

NEW POWER PROFILE

GE TRANSPORTATION ES44C4

ES44C4 SPECIFICATIONS

Length	73' 2"
Weight	208 tons
Height	15' 5"
Engine	GEVO-12
No. of cylinders	12
Traction horsepower	4,400
Traction alternator	GMG
Traction motors	GEB13 (x4)
Maximun speed	75 mph
Continuous tractive effort	105 klbs.
Starting tractive effort	144 klbs.
Dynamic braking effort	78 klbs.
Effective adhesion (All Weather)	25 percent
Fuel capacity	5,000 gals.

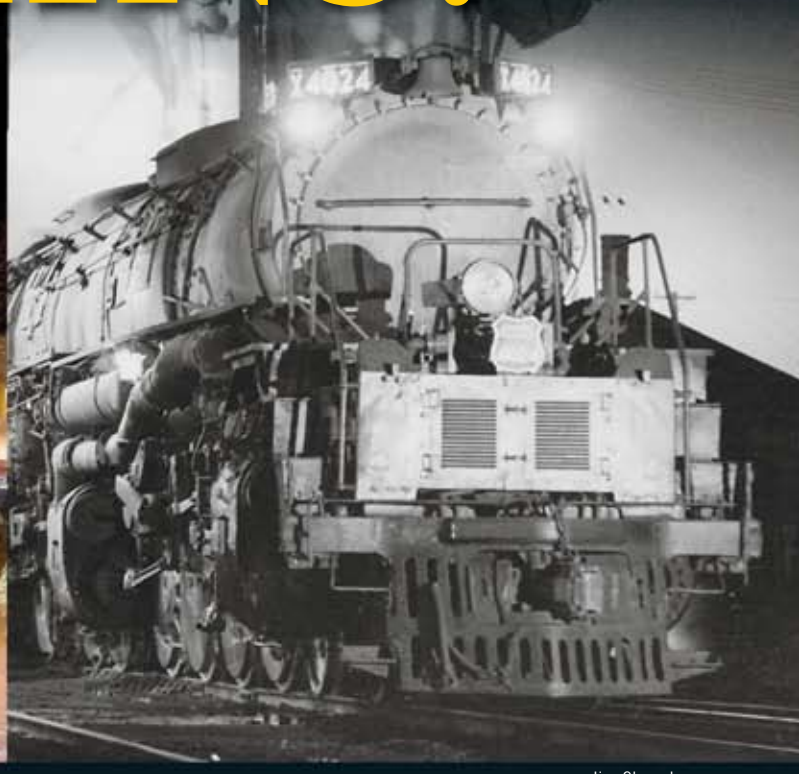
All photos Greg McDonnell

Cajon Pass, Calif., March 25, 2009

Bracketing the un-powered center axles of the ES44C4, as on BNSF 6620 at left, are truck-mounted air-cylinders and linkage connecting to the Dynamic Weight Management System. This technology automatically transfers weight to powered axles maximizing adhesion when starting, or as gradients or rail conditions warrant. The absence of a traction motor on center axle of BNSF 6620 (below) confirms A1A-A1A configuration.

EVERYTHING YOU NEED TO KNOW ABOUT TRAINS!

Tom Danneman



Jim Shaughnessy

Trains MAGAZINE

Trains magazine offers you first-person stories, up-to-date news, product reviews, technology features, trends and developments, and more. Plus, you'll get exclusive online access to subscriber-only PDF packages of stories from past ***Trains*** issues, new stories, locomotive rosters, Photo of the Week archive, and Trains News Wire, the daily digest of the day's top railroad stories, all await you on **TrainsMag.com**.

Classic Trains MAGAZINE

Classic Trains magazine is devoted to the "golden years" of railroading, the fascinating 1920s-1970s era. You'll travel back to the days of powerful steam locomotives, colorful early diesels, flashy streamliners, and more. Plus, you'll get exclusive online access to **ClassicTrainsMag.com** where subscribers can view the Photo of the Day archive.

SUBSCRIBE TODAY!

Order online at www.Trains.com

or call 1-800-533-6644, Monday – Friday, 8:30 a.m. – 4:30 p.m. Central Standard Time.

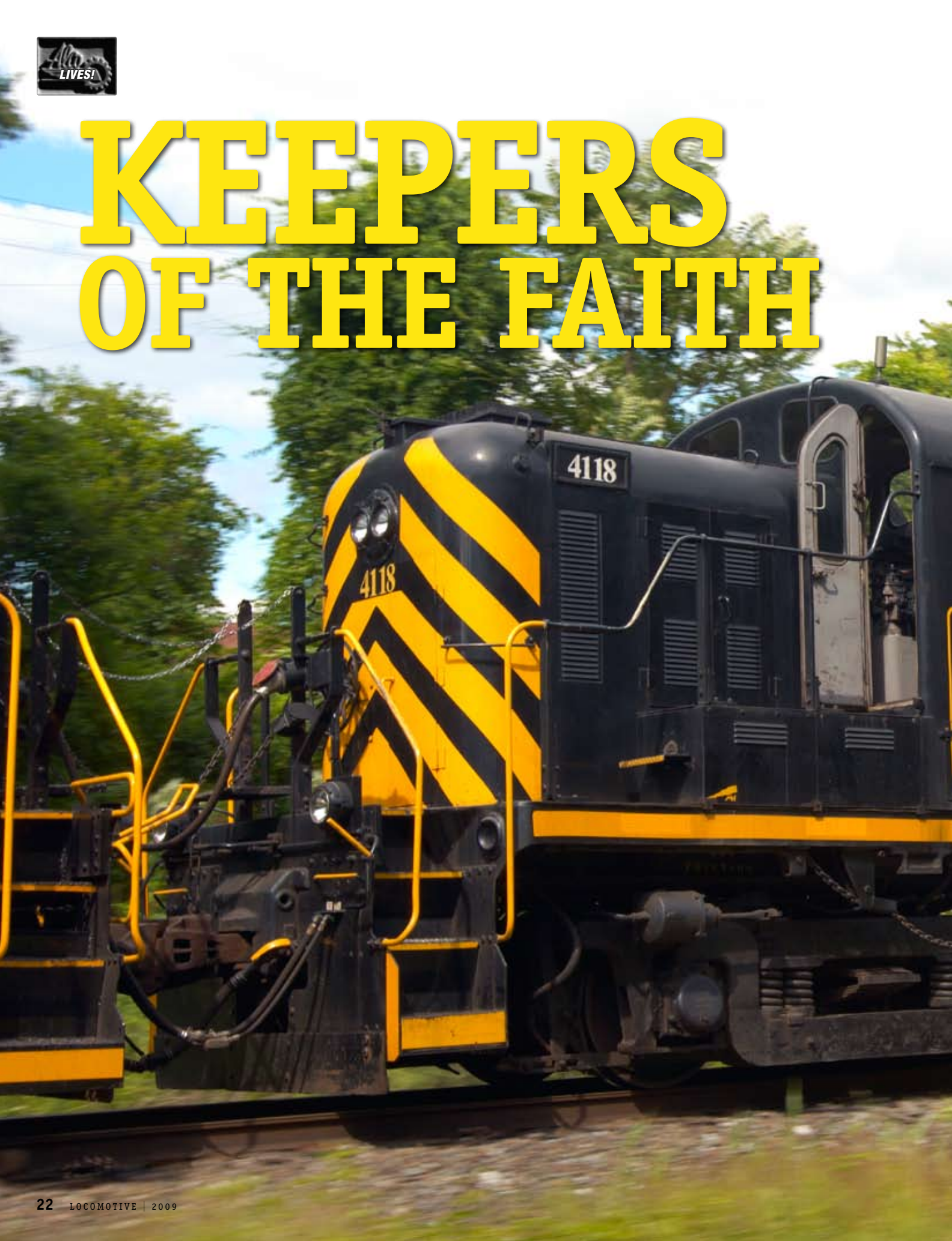
Outside the U.S. and Canada call 262-796-8776, ext. 661.

Please have your credit card ready.

CIR-ADH-09X1434RH

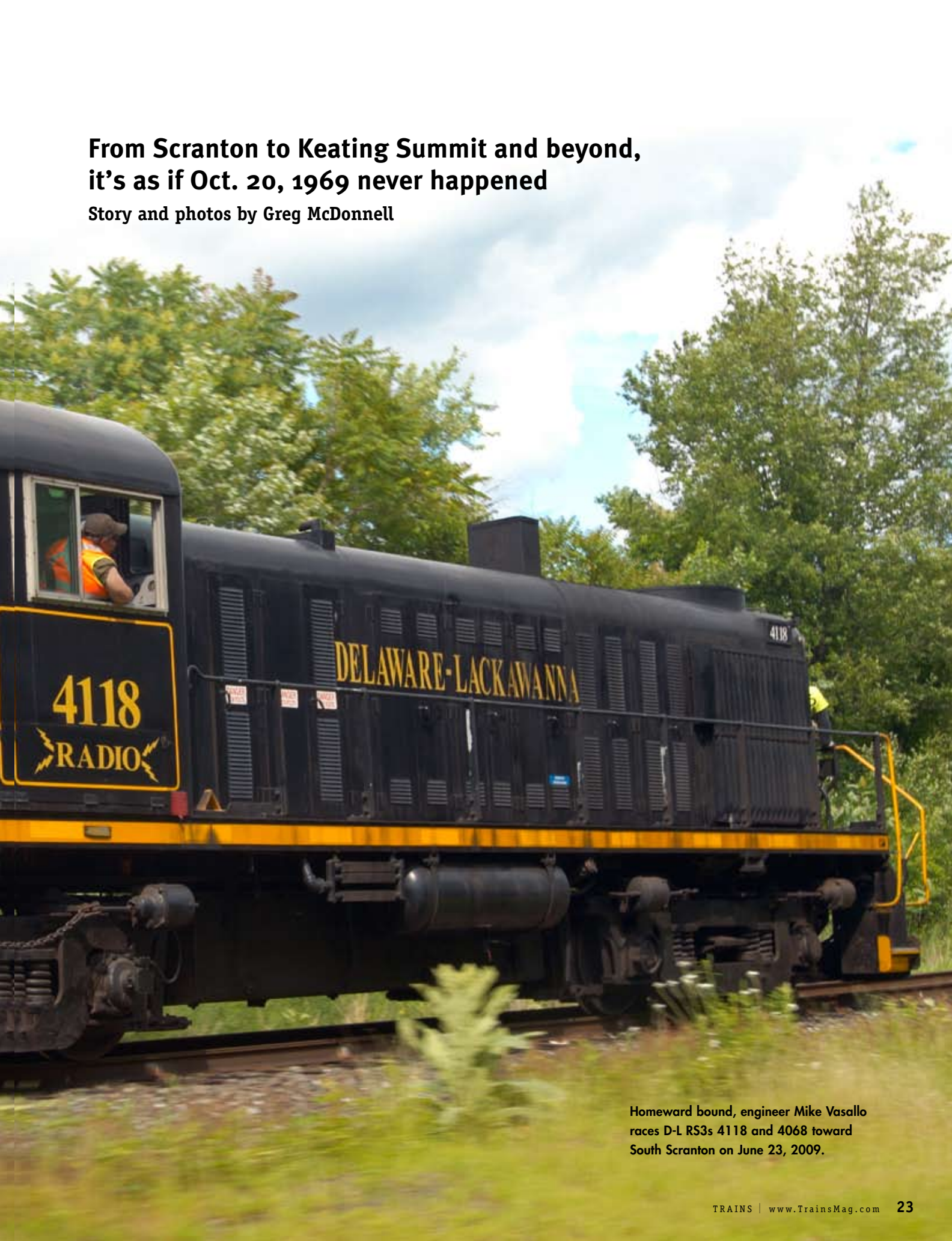
A99T6TK

KEEPERS OF THE FAITH



From Scranton to Keating Summit and beyond, it's as if Oct. 20, 1969 never happened

Story and photos by Greg McDonnell



Homeward bound, engineer Mike Vasallo races D-L RS3s 4118 and 4068 toward South Scranton on June 23, 2009.

Alco is dead. Or so they said on Oct. 20, 1969.

It's been four decades since Alco Locomotive Inc., officially announced its exit from the locomotive business, and just over half that since Bombardier, heir to Alco's longtime Canadian subsidiary Montreal Locomotive Works followed suit in 1988.

Orphaned by the corporate decision to shutter their birthplace, the legions of locomotives that carried American Locomotive Co., Alco Products, MLW, or Bombardier builder's plates on their flanks, and 539, 244 or 251 engines under their hoods weren't about to go quietly into the night. Or, for that matter, to go quietly at all.

Forty years down the road, Alco is anything but dead.

The ranks of Alcos and MLWs remaining in regular service have declined from several thousand to a couple hundred at best, but the survivors are no ragged company of museum candidates. Born of a defunct builder and aged 30, 40, 50 years and more, these aging Alcos not only defy the odds by their very existence, but their continuing performance as front-line locomotives operating in revenue, and often demanding service on regional and shortline carriers from Scranton, Pa., to Saskatchewan, to Snowflake, Ariz., to San Francisco is nothing short of phenomenal.

They owe it all to the true keepers of the faith: the talented, never-say-die CMOs and mechanics who keep these machines alive; men who understand the complexities of such things as regular and simplified amplidyne

Only in Scranton: RS3s 4118 and 4068 encounter C425 2453 on the climb toward Bridge 60. At right, Mike Vasallo and RS3 4068 depart for Carbondale. "They said it would never run again ... we just laugh when they say that."

Pride and dedication runs deep. CMO Don Colangelo cleans windows of D-L 4118 before dispatching the RS3 on the local to Carbondale.

control, the complications of a 1/90,000 undersized crankshaft and the mysteries behind the electrical panel doors of everything from a World War II-vintage S2, to a C636.

"Forty years?" Genesee Valley Transportation CMO Don Colangelo just shrugs at the notion as he steps into the freshly painted cab of Delaware-Lackawanna RS3 4068. In Colangelo's Scranton, Pa., shop, it's as if Oct. 20, 1969 never happened.

The 4068 is one of three operating RS3s in Colangelo's all-Alco stable. Recently done up in black and yellow colors that pay tribute to the unit's D&H heritage, 4068 and like-painted RS3 4118, another D&H veteran, are assigned to the Carbondale local on this June 2009 morning.

One of the most respected Alco men in the business, Colangelo dismisses the so-called "Alco stigma." They're like any machine," he says, better yet, they're remarkably fuel efficient. As for parts, "No problem," he asserts. "We can buy almost anything we need." "And," he emphasizes with visible pride, "we can fix anything."

"Anything" includes the 12-cylinder 244 engine beating under the 4068's hood. "The engine was seized when we got it," Colangelo notes. "They said it would never run again ... we just laugh when they say that."

Moments later, engineer Mike Vasallo notches out on the 4068's throttle to take the Carbondale local out of town,

Steamtown may be Scranton's main attraction, but on June 23, 2009, the big show in town is the DL local, with three RS3s. A fourth, Reading 467, is on display.

the once left-for-dead RS3 and companion 4118 accelerate northward with clean stacks. The 244 engine never sounded better.

A sight to behold, especially in 2009, reactivated and freshly reconditioned M636 RRPX 41 suns itself at Cohocton, N.Y., awaiting movement to the Western New York & Pennsylvania on June 22.

Kevin's babies (reprise)

Standing in front of the small Bath & Hammondsport shop in Cohocton, N.Y., a giant M636 basks its freshly painted face in the warm sun of a June 2009 evening. A sight to behold, RRPX 43, a former Quebec Cartier Mining unit turned out by MLW in May 1970 as CN 2302, is the realization of an admired Alco man's dream.

In October 2007, Kevin McGarvey, chief mechanical officer of Livonia, Avon & Lakeville and its subsidiary lines, stood outside the Cohocton shop, gestured toward the line of moribund six-motor MLWs and Alcos stored along the former Lackawanna main, and spoke of resuscitating and reconditioning a half-dozen for service on the grades of Western New York & Pennsylvania's portion of the ex-Pennsylvania Railroad Buffalo Line south of Olean, N.Y. An ambitious undertaking for a small railroad, but if anyone could accomplish the feat, McGarvey could.

As he spoke, workers in the shop were putting the finishing touches on WNYP 636, the first of the big Ms to be revived to join C630 No. 630 on the Buffalo Line. In May 2008, Kevin passed away, leaving his railroad family in shock and mourning the loss of a friend and an invaluable talent.

There's still a sense of sadness, but just over a year later, RRPX 43, a 388,000-pound, 3,600-hp, symbol of success, is ready to roll ... the sixth resuscitated six-motor Alco (all of them Montreal-built) to be dispatched from Cohocton to the WNYP.

Over on the Buffalo Line, McGarvey's plan to have at least six big Alcos assigned to Olean for the torturous run over Keating Summit to the Norfolk Southern connection at Driftwood has been implemented. On a hot June afternoon, the northbound Driftwood Turn has four of them: M636s 636 and 638 bracketing M630 631 and C630 630, and all the tonnage they're allowed over the 2.2 percent climb to Keating Summit.

Running for the hill, the quartet hammers through Gardeau at track speed, but as the last of the train's 45 loads rattles past the stone Pennsy marker at Mile 113 the train is rapidly losing momentum. The razor-sharp bark of straining 16-251s intensifies as the speed drops: 7, 6, 5 miles per hour. Tension mounts in the cab and there's talk of stalling, but the six-motor beasts hold the rail. Rousing the ghosts of Pennsy Decapods and generations of Keystone-bearing behemoths before them, the four MLWs claw their way up the legendary grade to the raucous roar of 64 flailing Alco 251F pistons.

If the rusted steel builder's plate on a riveted steel beam is to be believed, the old iron bridge at Keating Summit has spanned the tracks of the Buffalo Line since it was constructed by the Union Bridge Co., of Athens, Pa., in

Fulfilling Kevin McGarvey's dream, WNYP M636s 636 and 637 (right) await the call to duty at Olean, N.Y., in October 2008. At far right, northbound DFT tops Keating Summit on June 25, 2009, with a quartet of MLWs ... the ultimate display of Alco glory.

Recently revived and renumbered, WNYP M636 638 rolls the southbound DFT through Emporium, Pa., in June 2009.

1891. Leaning against an ancient beam and listening to the approaching racket, there is time to contemplate the wonders the old span must have witnessed. But not for long. Within minutes, the DFT rounds the curve and the sensory spectacle, the sight and sound, the smell of exhaust is all-consuming. It's hard to imagine that anything the venerable overpass has seen could be any more impressive than this.

In an eruption of heat and sound, the DFT blasts underfoot, victoriously cresting Keating Summit with maximum tonnage, maximum amperage, and maximum decibels.

Somewhere up above, Kevin McGarvey is smiling.

MINNESOTA TWINS

Minnesota Commercial's RS27s are the last of their breed

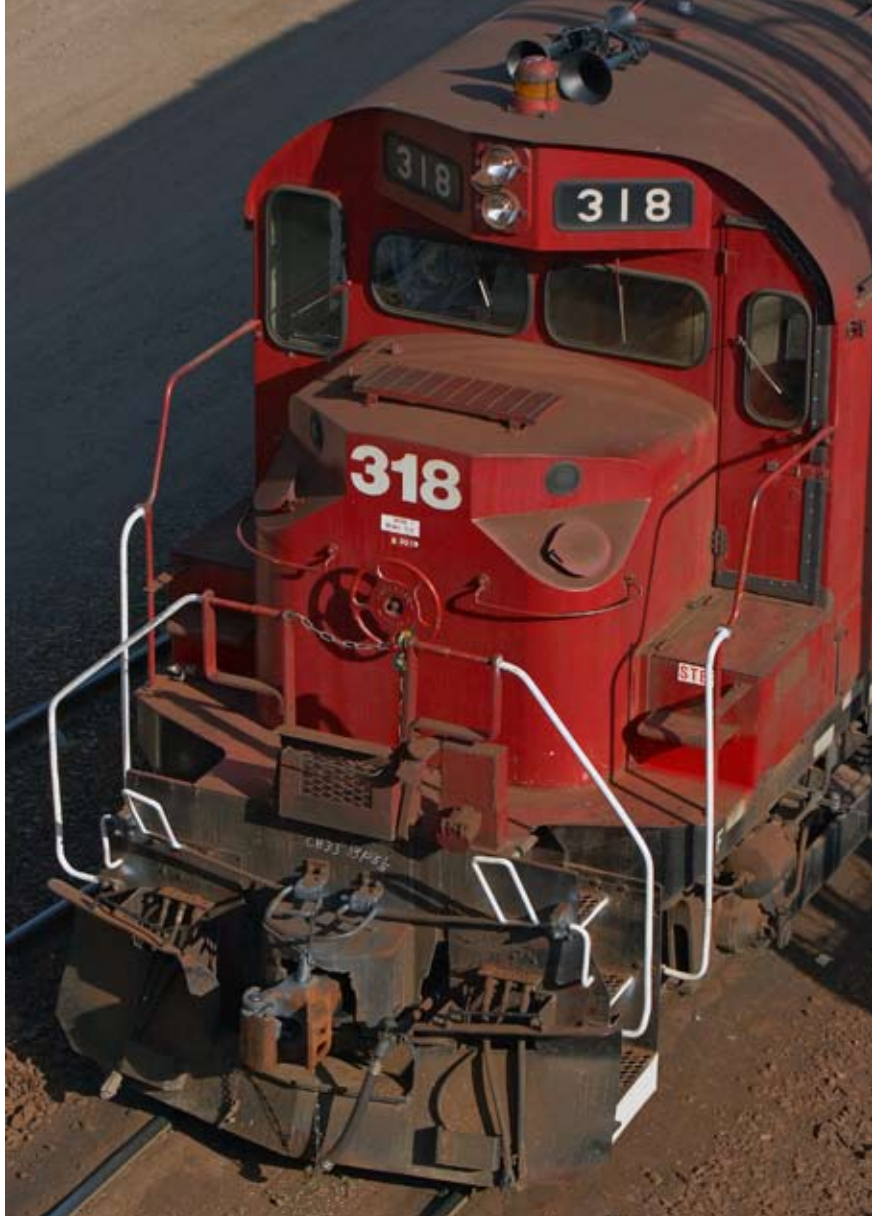
Story and photos by Steve Glischinski

The old roundhouse of the Minnesota Commercial Railway at 508 North Cleveland Ave. in St. Paul, Minn., is home to two special locomotives. They are MC 316 and 318, the only surviving examples of the Alco DL640, the pug-nosed, second-generation pioneer better known as the RS27.

Introduced in late 1959 when Alco outshopped the first of five DL640 demonstrators, the 2,400-hp B-B was unveiled just in time for a recession, and only 27 units were ever built. Delivered in November 1960 for a reported $222,000, Green Bay & Western 310 was the first RS27 sold. In the recession-wracked early '60s, it would take Alco another 10 months to make a second sale. Four of the five demonstrators became Union Pacific 675-678 in September 1961, but Alco didn't turn out another new RS27 until delivery of Chicago & North Western 900-903 in March 1962. Soo Line traded a pair of RSC2s for the famed "Dolly Sisters," outshopped in April 1962 as SOO 415 and 416. In October 1962, Alco filled the largest and last RS27 order as Pennsylvania Railroad 2400-2414 rolled off the Schenectady assembly line.

A transitional model, the RS27 was in the Alco catalog for little more than two years. In 1963, Alco shifted gears to produce its more successful Century line of locomotives. The first RS27, Alco demonstrator 640-1, was never sold, but its major components were used to build PRR 2415, Pennsy's sole C424.

After purchasing the first production-model DL640, Green Bay & Western, an all-Alco line operating between Winona, Minn., and the Lake Michigan car ferry terminal at Kewaunee, Wis., became an RS27 haven of sorts. When C&NW traded its RS27s back to Alco for C425s in 1966, GB&W purchased a pair from the Schenectady lot. C&NW 902 and 903 became GB&W 317 and 316. A third North Western veteran joined the roster in 1976, as former-C&NW 901 became GB&W 318 after spending a decade in the Precision National lease fleet.



Recently awakened from their long winter's nap, RS27s 318, at left, and 316, at right, perform switching chores in May 2009.

When Wisconsin Central affiliate Fox Valley & Western purchased GB&W in 1993, its all-Alco fleet still included RS27s 316 and 318. Wisconsin Central traded five ex-GB&W Alcos, including the RS27s, to Twin Cities terminal railroad Minnesota Commercial for four EMD SW1500s in December 1993.

Initially, the Commercial used the pair on transfers to Canadian Pacific's St. Paul Yard. Since discontinuance of the CP runs, the RS27s have been used singly in yard and transfer service. The radiator cores of both units were replaced in 2007 after an overzealous partier shot holes in the radiator sections of the units in the late 1990s. The pair has had a tendency to run hot ever since.

No mistaking that face: The RS27's notched pug nose gives it a signature look, unlike anything else in the Schenectady catalog.

Under the supervision of Chief Mechanical Officer Scott Wardrope, Commercial rotates units in and out of service as needs and maintenance requirements dictate. The 316 and 318 are stored in the winter due to balky cab heaters. Indirectly, the condition has helped extend their lives as they hibernate through cruel Minnesota winters.

While not the most successful locomotive design Alco produced, the last surviving RS27s deserve plaudits for longevity as they enter their 47th year of service. Barring a major failure, the "two of a kind" will continue to crank out the horsepower for the Minnesota Commercial, just as the RS27s designers hoped they would back in 1959. ▮

POWER PLAYS

HOW TO MANAGE 6,000 LOCOMOTIVES BNSF-style

by David Lustig

To the uninitiated, BNSF's James J. Hill Network Operations Center in Fort Worth looks like something the U.S. military would employ to successfully orchestrate a campaign. It should. Company architects, both structural and organizational, are said to have taken some of their cues from those very sources in designing the facility.

Since 1994, deep inside the company's Texas campus, protected by thick doors and triple-redundant electrical systems, BNSF has conducted its 24/7/365 battle plan to keep its daily operations fluid. Hundreds of employees are assigned to direct, dispatch, control and monitor train movements on every segment on the 32,000-mile system.

If a road crew, sitting with its train in the middle of the night, somewhere in the wilds of South Dakota, while waiting for its opposing number to pass, begins to wonder if someone out there has forgotten where they are, the answer is no.

NOC employees in Fort Worth know exactly the position of their train, the power assigned to it, the physical condition of the locomotives, the number of cars between them and the end-of-train device, and why they're sitting 20 miles east of nowhere. Just as they do the intermodal train slicing through Kansas on the Chicago-Los Angeles Transcon, the container train splitting the wind in New Mexico and the northbound just clearing Birmingham, Ala.

The railroad portion of the supply chain depends on crews and trains, and tracks and locomotives, and the people on duty at the NOC are very much aware that if any one of those segments begins to develop problems, it can cascade through the entire system, delaying trains and affecting customer service. That, barring acts of God, is a situation they try to never let happen.

One of those segments is the strength and health of the motive power on every train on the system. Using proprietary computer software capable of monitoring all major systems on every locomotive on every train, BNSF's Locomotive Utilization Team tries to anticipate problems and stay ahead of any developing situation that could slow the railroad down, especially in areas such as the ultra-critical Chicago-Los Angeles Transcon and other key corridors.

Every locomotive management position on the NOC floor has a work station with computer screens, each individually set up to display specific information including power available at each station, power assigned to each train, and the status of each locomotive. These displays, both in the giant NOC complex and in much smaller installations at specific locomotive facilities throughout the system, keep everyone informed on the whereabouts and health of the railroad's more than 6,600 active units.

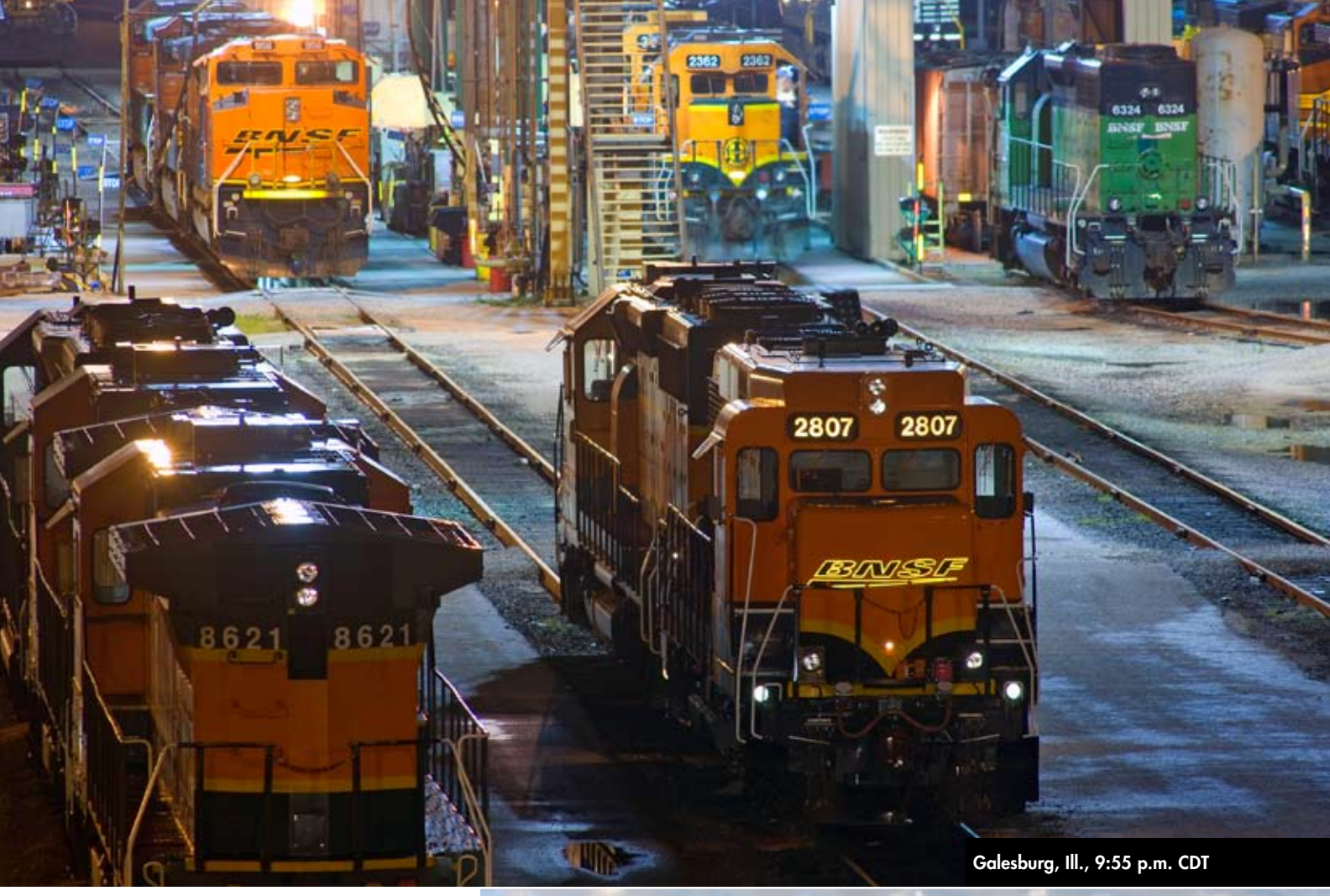
Many of us recall a previous, and perhaps more romantic — if not nearly as efficient — era when information on train movements and locomotive status was passed along by employees scribbling down information on printed forms. Two-way radio communication was hailed as such a giant step forward in the evolution of railroading that many companies proudly stenciled "radio-equipped" on their motive power.

Still, this form of communication could be less than satisfactory when it came to keeping a busy mainline fluid with unwanted surprises, such as a malfunctioning locomotive in a multi-unit consist or the realization that another unit in the consist was about out of operating time before requiring a scheduled inspection.

All photos June 19, 2009

Lyle, Wash., 6:57 a.m. PDT
G-BDEINB9-13A: BNSF 5260, 5513, 975 (DPU: BNSF 4159)

Scott Lothes



Galesburg, Ill., 9:55 p.m. CDT

The primary computer system for tracking, allocating and distributing motive power is LISS: Locomotive Information Service System.

"All train-by-train locomotive assignments on the system are broken down by territory," says Kevin Specht, one of the directors of locomotive utilization.

Specht says BNSF manages locomotives on a terminal-specific basis according to a standard Transportation Service Plan. The TSP includes not only the trains' schedule but also the number of cars, tonnage, footage and the number of locomotives to assign per train based on horsepower per ton required for the train to meet its schedule.

"Most of our six-axle EMDs consist of AC units assigned to the coal fleet," says Specht, "and the intermodal and merchandise fleet is usually handled by GEs, but power demands at any particular moment at any terminal can easily find one manufacturer's locomotive assigned to a service normally assigned to the other."

Galesburg, Ill., 8:08 p.m. CDT
Y-GAL2052-19B: BNSF 1925

Ancona, Ill., 10:10 a.m. CDT
Z-SBDWSP9-17L: BNSF 7413, CP 8810, BNSF 4951, 5111, 7595

Ancona, Ill., 10:15 a.m. CDT
E-CIPCAM0-92A: BNSF 9186, 9380

Williamsfield, Ill., 7:32 p.m. CDT
L-CHI1021-19I: BNSF 3142, EMDX 760, BNSF 6871, 2271, EMDX 773

All five photos Steve Smedley

Most locomotive utilization workstations have individual inbound and outbound screens, each filled with multiple train and locomotive icons that at first appear simplistic in their design. But upon closer inspection, a seasoned locomotive utilization professional has an incredible amount of easily digestible information about the motive power on each of the stations and trains he or she is responsible for.

Every locomotive on every train on the screen has a corresponding icon identifying the unit's reporting marks, road number, and the direction it is facing. The icon's outline color indicates the locomotive's service assignment, and inside that outline is a plethora of information designed to assist the locomotive manager. In addition, a variety of colors and shading inside each locomotive outline makes inspection and maintenance requirements clearly marked and easily understandable.

Alphabet soup

Information includes such items as the type and status of dynamic brakes. A small green square indicates operable extended-range dynamics; a red square indicates that the unit is equipped with extended-range dynamic brakes but they're not working. The absence of a box means the locomotive doesn't have them at all.

Another set of letters indicates the unit's home station assignment, permanent service assignment, and where the unit is assigned for maintenance. The letters RRB Y BAR, for example, would indicate a unit assigned to yard service at Riverbank, Calif., and assigned to Barstow for maintenance.

A series of numbers have their own codes attached to them, including the number of days until maintenance is due, whether the unit is overdue for inspection, and what type of maintenance it needs to receive. Other information includes whether the unit is scheduled to be picked up or set out or to run through a specific station. Then there is a carefully selected set of colors applied to an individual outline to give the status of the particular locomotive's health.

If the locomotive icon is solid white, it indicates the locomotive is operating satisfactorily and is lead qualified. Solid red indicates the locomotive is bad-ordered and not operating, perhaps it has a fuel leak, it won't start or it is bad-order for another reason; a numeric code indicates the nature of the bad-order condition. Solid gray indicates the unit is predicted, scheduled for a specific train.

A unit with the back half colored in blue means it is operating satisfactorily but has something to disqualify it as a lead unit. This could be due to a variety of problems such as a cracked windshield, an inoperable water cooler,


Andy Cummings

Genoa, Wis., 10:26 a.m. CDT
Z-SSECHC9-16A: BNSF 7227, 5513, 4775, 1000

Crozier Canyon, Ariz., 9:07 a.m. MST
Z ALTSBD1 18: BNSF 7433, 5287, 777


Steve Glischinski

Minneapolis, Minn., 10:40 a.m. CDT
H-NTWGAL2-19: CSXT 7551, NS 9566 / Y-NTW2142-17B: BNSF 6332


Jeff Terry

St. Paul, Minn., 4:52 p.m. CDT
V-CHCTAC1-19: BNSF 1114, 4994

Roy Inman

Kansas City, Mo., 3:06 p.m. CDT
BARGAL9 17: BNSF 774, 630

a seat that won't adjust or a plugged-up toilet. A unit with the front half white but the back half striped red indicates a bad actor, a locomotive that has a penchant for frequent mechanical problems or failures.

Then there are units that have their front half shaded:

- Red diagonal stripes mean the unit is smoking too much.
- Yellow means the unit is within six to nine days of its next scheduled maintenance date.
- Orange means the unit is within five days of its next maintenance date.
- Finally, a unit with green diagonal stripping on the front half indicates it was purchased with Texas Environmental Resource Protection funds and is currently outside the Lone Star state.

Among other locomotive icon color codes, a black-tipped nose means the unit is equipped with Auto Start, a black tipped nose outlined in red means it has an Auto Start that has failed, and a green tip means it is Auto Start equipped with a device that meets California air quality standards.

Foreign units are also clearly identified and it is not unusual to see a reference NS, CSX, UP, CN, CP and SOO locomotives. BNSF, by the way, has a

David Iustig

Lavic, Calif., 9:40 a.m. PDT
S HOULAC1 17: BNSF 706, 4906, 1031, 7612, 7653, 620

Ash Hill, Calif., 6:25 p.m. PDT
S CHISCO1 17: BNSF 740, 5069, 4794, 4834

David Styffe

policy that in normal operating conditions, a BNSF unit will be assigned to lead the locomotive consist.

Got that? And remember, a single locomotive consist of say, four or five units, can show a rainbow of colors to the locomotive manager, who has to decipher all the colors correctly to make sure the train can maintain its schedule. If not, the manager has to decide to add or remove a unit at the next terminal. Letting the proper people at that terminal know beforehand saves time and helps keep the train on or near schedule. The system is also an invaluable tool enabling outlying terminals to see what is headed their way.

Unlike Fort Worth, with its multiple workstations, the locomotive facility at Commerce, Calif., in the Los Angeles area has a single computer tied into the LISS operating system.

"It's a very visual system," explains Josh Ford, mechanical foreman at Commerce. "The system is designed to tell you what to expect so you can form a plan to see where you are going to be 12, 24, or 36 hours in the future."

For Ford and his counterparts around the BNSF system, LISS and its ability to let them see trains coming their way up to 72 hours in advance allows for a great deal of advanced planning. In Southern California, Ford can see as far east as Kansas (he usually doesn't need to go any farther than Barstow) which enables him to put together an organized plan to keep his part of the BNSF fluid. He can figure out what his facility will be required to do as far as servicing and running repairs. With LISS, rarely does he get a call that something unexpected in a failed unit is entering the yard.

"For us, it's a wonderful prediction tool to assign locomotives to outbound trains," he says. "It's pretty fantastic with the amount of information that is stored on just one computer screen."

Ford says that being able to visually see what is going on in other places on the BNSF system is very important.

"It's your lifeline to know what to expect, to see if you are going to be in trouble at some point during the day, or even a couple of days out and to know precisely what units you actually have on time.

"I'm not going to say we couldn't operate without it, but it gives us at least a tenfold efficiency advantage over using other methods. Without LISS we would not be able to adequately plan advanced locomotive movements in and out of Los Angeles.

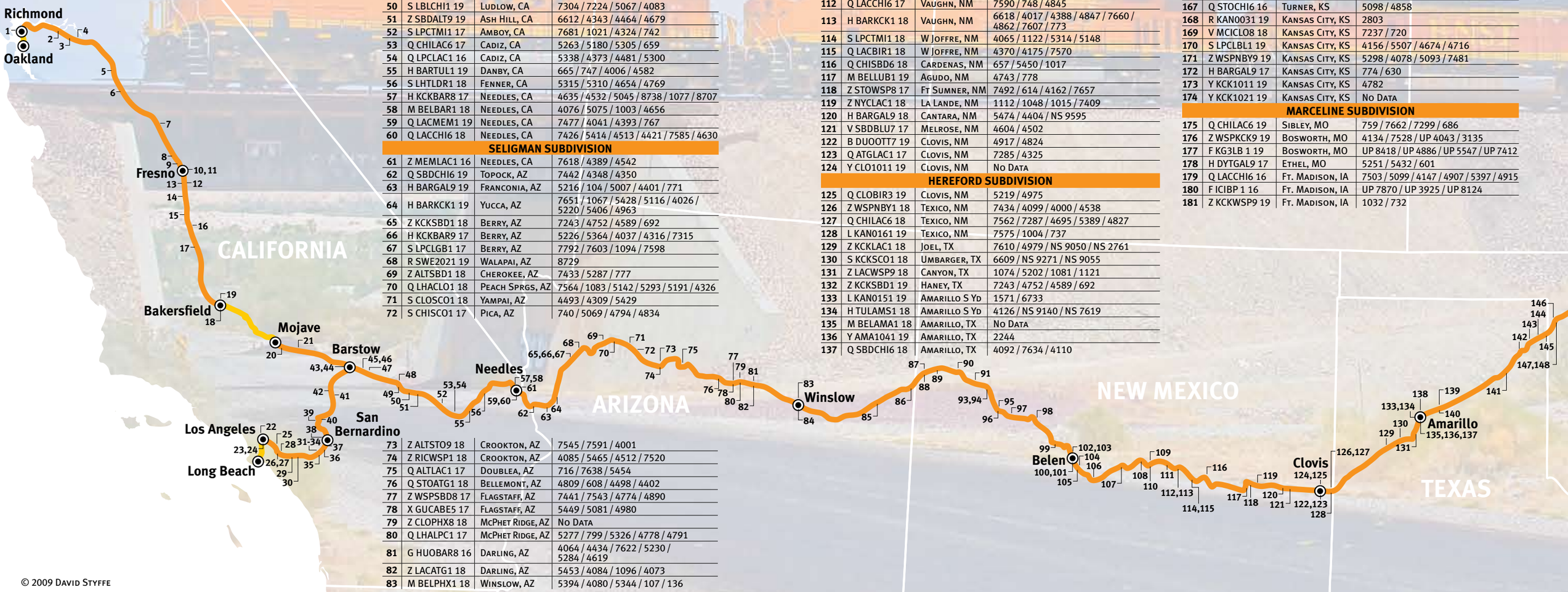
"It's as simple as that." T

#	SYMBOL	LOCATION	POWER CONSIST
STOCKTON SUBDIVISION			
1	R CAL0011 19	Richmond, CA	534
2	Z RICWSP1 19	Pittsburg, CA	5385 / 4982 / 7566 / 5071
3	B OIGSEA5 19	Oakley, CA	4153 / 776
4	L CAL2141 19	Bixler, CA	631 / 1002
5	Z NBYWSP1 19	Riverbank, CA	7273 / 4440 / 5445 / 7480
6	A 712 1 19	Denair, CA	AMTK 2003
7	A 701 1 19	Le Grand, CA	AMTK 86
8	M RICBAR1 19	Gregg, CA	7684 / 5010 / 607 / 5372 / 4172 / 4842
9	Q STOCHI6 18	Figarden, CA	5046 / 5156 / 5049 / 7606 / 4012
BAKERSFIELD SUBDIVISION			
10	H BARVAW1 19	Fresno, CA	7271 / 7289 / 4856 / 5393 / 5137
11	Z WSPNBY9 17	Fresno, CA	4066 / 4790 /4571
12	M BARSTO1 18	Bowles, CA	7478 / 7489 / 6600
13	A 702 1 19	Bowles, CA	AMTK 2006
14	H EVEBAR1 16	Shirley, CA	7475 / 4558 / 4736 / 5183 / 4660
15	R CAL0316 19	Guernsey, CA	No Data
16	M BARRIC3 18	Corcoran, CA	4057 / 7490 / 699 / 4771 / 4950 / 1088
17	M STOBAR1 19	Allensworth, CA	4880 / 7550 / 2183 / 647 / 4135
18	Z STOWSP8 18	Bakersfield, CA	7531 / 5292 / 5194 / 4506
MOJAVE SUBDIVISION			
19	A 713 1 19	Bakersfield, CA	AMTK 2001
20	F ILTEGR1 18	Sanborn, CA	UP 8313 / UP 8333
21	L CAL0611 19	Boron, CA	7712 / 7721

#	SYMBOL	LOCATION	POWER CONSIST
SAN BERNARDINO SUBDIVISION			
22	A 565 1 19	Redondo Jct, CA	AMTK 462
23	Q LACPEA1 19	Los Angeles, CA	1018 / 605 / 7672
24	A 768 1 19	Los Angeles, CA	No Data
25	R CAL0081 19	Buena Park, CA	2014
26	R CAL0061 19	Basta, CA	2895
27	Z LACNYC9 19	Basta CA	7547 / 5266 / 780 / 5390
28	A 567 1 19	Fullerton, CA	AMTK 457
29	Q LBALPC1 18	Esperanza, CA	7574 / 1025 / 4935 / 7667 / 4377 / 5167
30	F ML800 1 19	Prado Dam, CA	SCAX 867
31	F ML853 1 19	Riverside, CA	SCAX 884
32	F ML851 1 19	Riverside, CA	SCAX 888
33	F ML813 1 19	Riverside, CA	SCAX 901
34	F ML705 1 19	Riverside, CA	SCAX 898
35	R CAL0141 19	Riverside, CA	105 / 119
36	F ZLCAI 1 19	Highgrove, CA	No Data
37	F ZLAMQ 1 19	Colton, CA	No Data
CAJON SUBDIVISION			
38	Z WSPLAC9 17	San Bernardino	6606 / 7408 / 5308 / 4555
39	Q ATGLAC1 16	Cajon, CA	4086 / 4579 / 4157
40	F MWCRO 1 19	Cajon, CA	UP 5442 / UP 3806 / UP 7644 / UP 4823
41	Z LACWSP9 19	Victorville, CA	4491 / 5052 / 1110 / 966 / 5190
42	F HYRYR 2 19	Oro Grande, CA	UP 8474 / UP 8490
43	L CAL0102 18	Lenwood, CA	7767 / 7772 / 7747
44	F MNPWC 1 16	Lenwood, CA	UP 5505 / UP 8520 / UP 8106
NEEDLES SUBDIVISION			
45	F CSKMJ 1 17	Daggett, CA	UP 6475 / UP 6696 / UP 7057 / UP 5845
46	H SLABAR4 17	Daggett, CA	7405 / CN 5760 / 4645 / 738
47	B ESSSBD7 18	Minneola, CA	1097 / 4431 / 4054 / 6619 / 1099 / 7284
48	S HOULAC1 17	Pisgah, CA	706 / 4906 / 1031 / 7612 / 7653 / 620
49	M BARBEL1 19	Pisgah, CA	4062 / 4429 / 4100 / 4166
50	S LBLCHI1 19	Ludlow, CA	7304 / 7224 / 5067 / 4083
51	Z SBDALT9 19	Ash Hill, CA	6612 / 4343 / 4464 / 4679
52	S LPCTMI1 17	Amboy, CA	7681 / 1021 / 4324 / 742
53	Q CHILAC6 17	Cadiz, CA	5263 / 5180 / 5305 / 659
54	Q LPCLAC1 16	Cadiz, CA	5338 / 4373 / 4481 / 5300
55	H BARTUL1 19	Danby, CA	665 / 747 / 4006 / 4582
56	S LHTLDR1 18	Fenner, CA	5315 / 5310 / 4654 / 4769
57	H KCKBAR8 17	Needles, CA	4635 / 4532 / 5045 / 8738 / 1077 / 8707
58	M BELBAR1 18	Needles, CA	4076 / 5075 / 1003 / 4656
59	Q LACMEM1 19	Needles, CA	7477 / 4041 / 4393 / 767
60	Q LACCHI6 18	Needles, CA	7426 / 5414 / 4513 / 4421 / 7585 / 4630
SELIGMAN SUBDIVISION			
61	Z MEMLAC1 16	Needles, CA	7618 / 4389 / 4542
62	Q SBDCHI6 19	Topock, AZ	7442 / 4348 / 4350
63	H BARGAL9 19	Franconia, AZ	5216 / 104 / 5007 / 4401 / 771
64	H BARKCK1 19	Yucca, AZ	7651 / 1067 / 5428 / 5116 / 4026 / 5220 / 5406 / 4963
65	Z KCKSBD1 18	Berry, AZ	7243 / 4752 / 4589 / 692
66	H KCKBAR9 17	Berry, AZ	5226 / 5364 / 4037 / 4316 / 7315
67	S LPCLGB1 17	Berry, AZ	7792 / 7603 / 1094 / 7598
68	R SWE2021 19	Walapai, AZ	8729
69	Z ALTSBD1 18	Cherokee, AZ	7433 / 5287 / 777
70	Q LHACLO1 18	Peach Sprgs, AZ	7564 / 1083 / 5142 / 5293 / 5191 / 4326
71	S CLOSCO1 18	Yampai, AZ	4493 / 4309 / 5429
72	S CHISCO1 17	Pica, AZ	740 / 5069 / 4794 / 4834
73	Z ALTSTO9 18	Crookton, AZ	7545 / 7591 / 4001
74	Z RICWSP1 18	Crookton, AZ	4085 / 5465 / 4512 / 7520
75	Q ALTLAC1 17	Doublea, AZ	716 / 7638 / 5454
76	Q STOATG1 18	Bellemont, AZ	4809 / 608 / 4498 / 4402
77	Z WSPSBD8 17	Flagstaff, AZ	7441 / 7543 / 4774 / 4890
78	X GUCABE5 17	Flagstaff, AZ	5449 / 5081 / 4980
79	Z CLOPHX8 18	McPhet Ridge, AZ	No Data
80	Q LHALPC1 17	McPhet Ridge, AZ	5277 / 799 / 5326 / 4778 / 4791
81	G HUOBAR8 16	Darling, AZ	4064 / 4434 / 7622 / 5230 / 5284 / 4619
82	Z LACATG1 18	Darling, AZ	5453 / 4084 / 1096 / 4073
83	M BELPHX1 18	Winslow, AZ	5394 / 4080 / 5344 / 107 / 136

#	SYMBOL	LOCATION	POWER CONSIST
GALLUP SUBDIVISION			
84	Z SBDWSP2 18	Winslow, AZ	5407 / 4188 / 7265 / 5524
85	E SPTNAM 018	E Coronado Jct	No Data
86	B BARBWW5 18	Lupton, AZ	4063 / 7440
87	C MCMDIR 004	Defiance, NM	5047 / 661 / 5128
88	E SPVESM 086	Defiance, NM	5510 / 4456 / 5086 / 5055 / 4598 / 4676
89	Z LACWSP2 18	Gallup, NM	4673 / 4375 / 4974 / 5022
90	G HTISWA9 15	Perea, NM	7429 / 4967 / 4452 / 1037 / 7308 / 7511
91	S PTRLHA5 17	Thoreau, NM	4067 / 7455 / 4865 / 1040
92	C ESMJCC 061	Baca, NM	5132 / 4539 / 4550 / 9208 / 9553 / 8821 / 9222
93	M BARBEL3 18	Baca, NM	674 / 4371 / 6356
94	Q LBACLO1 18	Baca, NM	7656 / 626 / 4884 / 4311 / 693 / 4622
95	Z WSPNBY8 18	Grants, NM	7659 / 4466 / 788 / 7690
96	X BARBRE1 18	Grants, NM	1011 / CSXT 386
97	H AMSBAR4 18	McCartys, NM	4069 / 4185 / 5317 / 762
98	H KCKBAR8 18	Marmon, NM	4635 / 4532 / 5045 / 8738 / 1077 / 8707
99	A 4 1 18	Rio Puerco, NM	AMTK 154 / AMTK 40
100	Q STOCHI6 17	Belen, NM	4607 / 4733 / 4138 / 7502
101	Z LACALT1 18	Belen, NM	5367 4577 / 4649
CLOVIS SUBDIVISION			
102	M ELPAMA1 18	Belen, NM	5374 / 7216 / 717 / 700 / 5025 / 754
103	Z KCKNBY1 18	Belen, NM	5423 / 4497 / 1078
104	H PTXBAR9 17	Madrone, NM	741 / 640 / 5366 / 5196
105	V SDGCLO1 17	Madrone, NM	4112 / 4748
106	G HMGBAR8 13	Scholle, NM	5018 / 4075 / 4685 / 5245 / 5436
107	Z NBYWSP9 18	Willard, NM	5499 / 7256 / 7665 / 7221
108	Z LACNYC9 18	Culebra, NM	4566 / 4944 / 5043 / 5273
109	S HOUSCO1 18	Pedernal, NM	4463 / 1047 / 4485 / 4510 / 5179
110	Z SBDWSP1 18	Pedernal, NM	5285 / 4390 / 7460 / 5229
111	S LHWCHI1 17	Carnero, NM	4741 / 4620 / 4953 / 701 / 4850
112	Q LACCHI6 17	Vaughn, NM	7590 / 748 / 4845
113	H BARKCK1 18	Vaughn, NM	6618 / 4017 / 4388 / 4847 / 7660 / 4862 / 7607 / 773
114	S LPCTMI1 18	W Joffre, NM	4065 / 1122 / 5314 / 5148
115	Q LACBIR1 18	W Joffre, NM	4370 / 4175 / 7570
116	Q CHISBD6 18	Cardenas, NM	657 / 5450 / 1017
117	M BELLUB1 19	Agudo, NM	4743 / 778
118	Z STOWSP8 17	Ft Sumner, NM	7492 / 614 / 4162 / 7657
119	Z NYCLAC1 18	La Lande, NM	1112 / 1048 / 1015 / 7409
120	H BARGAL9 18	Cantara, NM	5474 / 4404 / NS 9595
121	V SBDBLU7 17	Melrose, NM	4604 / 4502
122	B DUOOTT7 19	Clovis, NM	4917 / 4824
123	Q ATGLAC1 17	Clovis, NM	7285 / 4325
124	Y CLO1011 19	Clovis, NM	No Data
HEREFORD SUBDIVISION			
125	Q CLOBIR3 19	Clovis, NM	5219 / 4975
126	Z WSPNBY1 18	Texico, NM	7434 / 4099 / 4000 / 4538
127	Q CHILAC6 18	Texico, NM	7562 / 7287 / 4695 / 5389 / 4827
128	L KAN0161 19	Texico, NM	7575 / 1004 / 737
129	Z KCKLAC1 18	Joel, TX	7610 / 4979 / NS 9050 / NS 2761
130	S KCKSCO1 18	Umbarger, TX	6609 / NS 9271 / NS 9055
131	Z LACWSP9 18	Canyon, TX	1074 / 5202 / 1081 / 1121
132	Z KCKSBD1 19	Haney, TX	7243 / 4752 / 4589 / 692
133	L KAN0151 19	Amarillo S Yd	1571 / 6733
134	H TULAMS1 18	Amarillo S Yd	4126 / NS 9140 / NS 7619
135	M BELAMA1 18	Amarillo, TX	No Data
136	Y AMA1041 19	Amarillo, TX	2244
137	Q SBDCHI6 18	Amarillo, TX	4092 / 7634 / 4110

#	SYMBOL	LOCATION	POWER CONSIST
PANHANDLE SUBDIVISION			
138	V BIRCLO8 17	Amarillo, TX	5487 / 4744
139	S LPCLGB1 18	St Francis, TX	4021 / 980 / 1064 / 6602
140	L KAN0351 19	St Francis, TX	6735 / 2940 / 6895
141	X WATMNX7 17	Miami. TX	7254 / CN 5354
142	G SLVSMR5 17	Canadian, TX	7464 / 5200 / 7676
143	Q NYCLAC6 18	Clear Creek, TX	713 / 5302 / 5218
144	Q CHIOIG1 18	Coburn, TX	4089 / 7663 / 635 / 4545
145	Q LACNYC6 17	Higgins, TX	7242 / 4831 / 4580 / 7247
146	G CCDELP9 18	Goodwin, OK	4378 / 4118 / 5032 / 5161
147	S LHACHI2 16	Shattuck, OK	4453 / 7507 / 4690
148	Z RICWSP1 17	Shattuck, OK	987 / 4533 / 4601 / 4027
149	M AMSKCK1 19	Fargo, OK	7473 / NS 9542 / 4707
150	X DHTEDY5 19	Tangier, OK	4109 / 695 / 7232
151	Q LBTLPC1 16	Gerlach, OK	7488 / 7267 / 4633 / 4391
152	Z WSPLAC1 18	Waynoka, OK	5360 / 4376 / 4888 / 7417
153	Q CLOLPC1 18	Waynoka, OK	7692 / 1072 / 4033
154	Z LACATG1 17	Avard, OK	5331 / 7328 / 5170
155	H KCKBAR8 19	Noel, OK	7269 / NS 9933 / 5842 / 5348
156	G CRLKCK4 18	Loder, OK	5319 / 7596 / 4408
157	Z CHIPHX1 18	Harper, KS	7568 / 750 / 7211
EMPORIA SUBDIVISION			
158	G WLMELP5 15	Wellington, KS	4426 / 4050 / 7465
159	Z WSPSBD8 18	Cicero, KS	4505 / 7452 / 7674
160	W AKSARK1 15	Augusta, KS	5458 / 7212
161	Y EDR1011 19	Eldorado, KS	No Data
162	L KAN0081 19	Emporia, KS	9873 / 9820
163	Z ALTWSP1 19	Emporia, KS	4136 / 5079 / 5505
164	U DAVHMO9 18	Wellsville, KS	962 / 5107
165	H PUEKCK9 18	Holliday, KS	7494 / 7202
166	U WELKCK5 19	Holliday, KS	7620
167	Q STOCHI6 16	Turner, KS	5098 / 4858
168	R KAN0031 19	Kansas City, KS	2803
169	V MCICLO8 18	Kansas City, KS	7237 / 720
170	S LPCLBL1 19	Kansas City, KS	4156 / 5507 / 4674 / 4716
171	Z WSPNBY9 19	Kansas City, KS	5298 / 4078 / 5093 / 7481
172	H BARGAL9 17	Kansas City, KS	774 / 630
173	Y KCK1011 19	Kansas City, KS	4782
174	Y KCK1021 19	Kansas City, KS	No Data
MARCELINE SUBDIVISION			
175	Q CHILAC6 19	Sibley, MO	759 / 7662 / 7299 / 686
176	Z WSPKCK9 19	Bosworth, MO	4134 / 7528 / UP 4043 / 3135
177	F KG3LB 1 19	Bosworth, MO	UP 8418 / UP 4886 / UP 5547 / UP 7412
178	H DYTGAL9 17	Ethel, MO	5251 / 5432 / 601
179	Q LACCHI6 16	Ft. Madison, IA	7503 / 5099 / 4147 / 4907 / 5397 / 4915
180	F ICIBP 1 16	Ft. Madison, IA	UP 7870 / UP 3925 / UP 8124
181	Z KCKWSP9 19	Ft. Madison, IA	1032 / 732

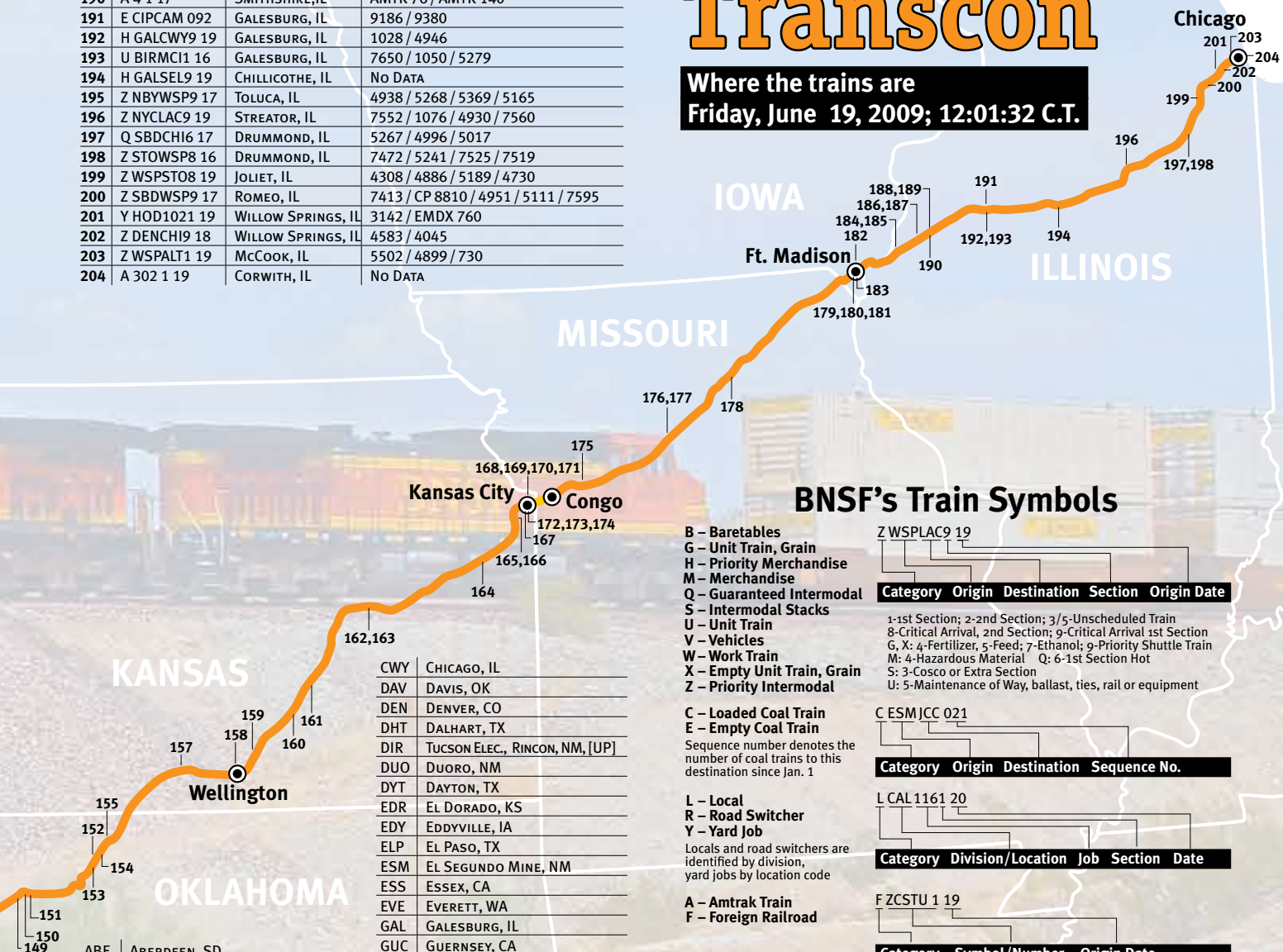


>> For a current BNSF locomotive roster, visit www.TrainsMag.com

BNSF's Southern Transcon

Where the trains are
Friday, June 19, 2009; 12:01:32 C.T.

#	SYMBOL	LOCATION	POWER CONSIST
	CHILLICOTHE SUBDIVISION		
182	F ZCSTU 1 18	Ft. Madison, IA	UP 8241 / UP 9467
183	S LHACHI1 16	Ft. Madison, IA	4333 / 4696 / KCS 4578
184	S LPCTMI1 19	Lomax, IL	5234 / 7540 / 697 / 4954
185	F IBPCI 1 19	Lomax, IL	UP 8170 / UP 7723
186	Q LPCLAC1 18	Stronghurst, IL	763 / 7458 / 4011 / 4170
187	G EDYDHT5 17	Stronghurst, IL	4854 / 7512 / 5255
188	Q CHISBD6 19	Smithshire, IL	4132 / 985 / 4976
189	F KG2LB 1 19	Smithshire, IL	UP 5510 / UP 4975 / UP 3920 / UP 5273
190	A 4 1 17	Smithshire,IL	AMTK 76 / AMTK 140
191	E CIPCAM 092	Galesburg, IL	9186 / 9380
192	H GALCWY9 19	Galesburg, IL	1028 / 4946
193	U BIRMCI1 16	Galesburg, IL	7650 / 1050 / 5279
194	H GALSEL9 19	Chillicothe, IL	No Data
195	Z NBYWSP9 17	Toluca, IL	4938 / 5268 / 5369 / 5165
196	Z NYCLAC9 19	Streator, IL	7552 / 1076 / 4930 / 7560
197	Q SBDCHI6 17	Drummond, IL	5267 / 4996 / 5017
198	Z STOWSP8 16	Drummond, IL	7472 / 5241 / 7525 / 7519
199	Z WSPSTO8 19	Joliet, IL	4308 / 4886 / 5189 / 4730
200	Z SBDWSP9 17	Romeo, IL	7413 / CP 8810 / 4951 / 5111 / 7595
201	Y HOD1021 19	Willow Springs, IL	3142 / EMDX 760
202	Z DENCHI9 18	Willow Springs, IL	4583 / 4045
203	Z WSPALT1 19	McCook, IL	5502 / 4899 / 730
204	A 302 1 19	Corwith, IL	No Data



BNSF's Train Symbols

B – Baretables
G – Unit Train, Grain
H – Priority Merchandise
M – Merchandise
Q – Guaranteed Intermodal
S – Intermodal Stacks
U – Unit Train
V – Vehicles
W – Work Train
X – Empty Unit Train, Grain
Z – Priority Intermodal

Z WSPLAC9 19
Category Origin Destination Section Origin Date

1-1st Section; 2-2nd Section; 3/5-Unscheduled Train
8-Critical Arrival, 2nd Section; 9-Critical Arrival 1st Section
G, X: 4-Fertilizer, 5-Feed; 7-Ethanol; 9-Priority Shuttle Train
M: 4-Hazardous Material Q: 6-1st Section Hot
S: 3-Cosco or Extra Section
U: 5-Maintenance of Way, ballast, ties, rail or equipment

C – Loaded Coal Train
E – Empty Coal Train
Sequence number denotes the number of coal trains to this destination since Jan. 1

C ESM JCC 021
Category Origin Destination Sequence No.

L – Local
R – Road Switcher
Y – Yard Job
Locals and road switchers are identified by division, yard jobs by location code

L CAL 1161 20
Category Division/Location Job Section Date

A – Amtrak Train
F – Foreign Railroad

F ZCSTU 1 19
Category Symbol/Number Origin Date

ABE	Aberdeen, SD
ALT	Alliance (Ft. Worth), TX
AMA	Amarillo, TX
AMS	Amarillo South Yard, TX
ARK	Arkansas City, KS
ATG	Atlanta, GA
BAR	Barstow, CA
BEL	Belen, NM
BIR	Birmingham, AL
BLU	Blue Island, IL
BRE	Breckenridge, MN
BWW	Brownwood, TX
CAL	California Division
CAM	Caballo Mine, WY
CCD	Concordia, KS
CHI	Chicago, IL/Chicago Div.
CIP	Cicero (IHB), IL
CLO	Clovis, NM
CRL	Carlsbad, NM
CWY	Chicago, IL
DAV	Davis, OK
DEN	Denver, CO
DHT	Dalhart, TX
DIR	Tucson Elec., Rincon, NM, [UP]
DUO	Duoro, NM
DYT	Dayton, TX
EDR	El Dorado, KS
EDY	Eddyville, IA
ELP	El Paso, TX
ESM	El Segundo Mine, NM
ESS	Essex, CA
EVE	Everett, WA
GAL	Galesburg, IL
GUC	Guernsey, CA
HMG	Hemingford, NE
HMO	Hamm, MO
HOD	Hodgkins, IL
HOU	Houston, TX
HTI	Hinton, IA
HUO	Hugoton, KS
JCC	Joseph City, AZ
KAN	Kansas Division
KCK	Kansas City, KS
LAC	Los Angeles, CA
LBA	Long Beach, CA, Pier A
LBL	Long Beach, CA, LBCT
LBT	Long Beach, CA, Pier T
LDR	Landers, IL
LGB	Long Beach, CA
LHA	LA Harbor, CA, Pier 400
LHT	LA Harbor, CA, TICTF
LHW	LA Harbor, CA, West Basin
LPC	Logistics Park, Chicago, IL
LUB	Lubbock, TX
MCI	McCook, IL
MCM	McKinley Mine, N. Tipple, NM
MEM	Memphis, TN
MNX	Mendota, TX
NAM	North Antelope Mine, WY
NBY	North Bay (Richmond), CA
NYC	New York, NY
OIG	Oakland Int'l Gateway, CA
OTT	Ottawa, KS
PEA	Pearland, TX
PHX	Phoenix, AZ
PTR	Port Arthur, TX
PTX	Pasadena, TX
PUE	Pueblo, CO
RIC	Richmond, CA
SBD	San Bernardino, CA
SCO	Thenard, CA
SDG	San Diego, CA
SEA	Port Arthur, TX
SLA	Slaton, TX
SLV	Silvis Transfer, IL
SMR	Summerfield, TX
SPV	Springerville, AZ
STO	Stockton, CA
SWA	Swanson, CA
SWE	Southwest Division
TMI	Terminal Island, CA
TUL	Tulsa, OK
VAW	Vancouver, WA
WAT	Watson, CA
WEL	Wellington, KS
WLM	Willmar, MN
WSP	Willow Springs, IL

CANADA'S OLDEST ACTIVE ALCO

65... and still going strong!

Story and photos by James A. Brown

It's a sunny morning in Port Colborne, Ont., and Trillium Railway Co. S2 No. 7024 is ready for another day of service on the Port Colborne Harbour Railway. PCH is a short line that began operations in 1997, and today operates 37 miles of ex-Canadian National track paralleling the Welland Canal between Port Colborne and St. Catharines, Ont.

To the casual bystander looking on as 7024 assembles its train at PCH's Feeder Yard, this is just another diesel switcher; unremarkable, except perhaps for its distinctive twittering stack talk as it leans into its load. Just a hint of smoke at the stack as the engine spools up suggests good condition and careful maintenance, all belying that 7024, at 65 years old, is the oldest locomotive routinely available for service on a Canadian railroad.

On a frosty morning in February 2009, 65-year-old 7024 crosses the old Welland Canal at Dain. The lift bridge is permanently fixed since this section of the canal was bypassed in 1970s relocation.

Life began for the 1,000-hp S2 switcher on Oct. 10, 1944, when it rolled out of the

American Locomotive Co. works in Schenectady, N.Y., as the 15th production diesel locomotive delivered to the Canadian Pacific Railway. It has regained its number.

Unlike many North American railroads, Canadian Pacific was reluctant to embrace dieselization. Beginning in 1929, British-born Henry B. Bowen oversaw CP's mechanical department for 20 years. He staunchly advocated steam. Bowen's modern road power, including the Royal Hudsons, semi-streamlined Selkirks, heavy Pacifics, and Mikados, all carried the Canadian Pacific banner proudly through the 1950s. CP's last new steam power, six T1c 2-10-4s, arrived in 1949, just two months before Bowen's retirement and five years after the delivery of No. 7024 and its sister locomotives.

But from CP's experience with an experimental diesel switcher starting in 1937, and promising reports from other North American users, even Bowen could not deny the economy of the diesel locomotive in switching service. The diesel cost less to operate, and idled cheaply, or could be shut down. CP's steam switcher fleet was tired. To meet wartime demands, from 1942 to 1944 CP acquired 45 heavy 2-8-2s and 85 heavy 4-6-2s for road service, and 15 diesel-electric switchers. The 7024, the last of this group, went swiftly to work in the Toronto area, and toiled there for CP for more than four decades.

By the mid-1980s, CP was aggressively replacing its old diesel switchers with rebuilt first-generation Geeps. Unlike so many of its fellow units, still serviceable to the end, S2 No. 7024 found a new home in 1986 on the north shore of Lake Superior at the pulp mill of James River Marathon, in Marathon, Ont. It served as backup to James River's MLW S13, acquired new in 1966. The 7024 lost its original number in favor of an accountant's asset designation, 17-102, but otherwise soldiered on until the task was turned over to contract switching in 2004.

Then Trillium Railway snapped up James River's two units for its growing fleet. With the exception of a lone GE 44-tonner, Trillium's roster is all-Alco. Trillium's eight serviceable locomotives are used on PCH and Trillium's other short line, the St. Thomas & Eastern, in southwestern Ontario. Restored to its original number, 7024 works as a spare for PCH S13s 108 and 110 (both ex-CN).

"We've tried to focus on 251-engined locomotives," Trillium's Vice President Doug Wilson says, "but the 7024's an exception. Like all 539-engined units, she shakes and rattles the glass in the window frames, but she still pulls hard, and after 65 years she still gets the job done." ▮

A fixture in the Toronto Terminals for most of its CPR career, No. 7024 rattles through West Toronto (above) with a westbound piggyback transfer on Aug. 26, 1961; 48 years later, on Aug. 4, 2009 (below), Trillium chairman Wayne Ettinger is at the throttle of the elderly S2 at Port Colborne.

NORTHEASTERN ALCO GIANT

Story and photos by Scott A. Hartley

Matt Martin

Alcos rule Genesee Valley Transportation's 300-plus mile network of New York and Pennsylvania lines

It's just another day at work for the Genesee Valley Transportation engineer and conductor reporting at GVT subsidiary Delaware-Lackawanna Railroad's South Scranton, Pa., crew office. In the next 10 hours, they will serve railroad customers around Scranton and in the Pocono Mountains using an incredible variety of locomotives built long ago by both Alco and Montreal Locomotive Works. First, they board a C425 painted in the gray, maroon, and yellow colors of its original owner, Erie Lackawanna, to switch cars in the one-time EL Scranton Yard, adjacent to today's Steamtown National Historic Site. Later in the morning they take a waiting C420 of Lehigh Valley and Delaware & Hudson heritage to deliver several cars to an outlying yard. There is little time for lunch, as customers 32 miles east of Scranton are awaiting delivery of propane tank cars and grain-filled covered hoppers. Facing the legendary Pocono grade of the old Delaware, Lackawanna & Western, the two climb aboard MLW M630 No. 3000. Originally built for the British Columbia Railway, and acquired several years ago from GE, the 3000 is one of three 6-motor Alcos in the D-L fleet. Behind the 3,000-hp red-and-gray monster is Alco C636 No. 3642, ordered by the Pennsylvania Railroad in 1967, but delivered to the then-new Penn Central in 1968. In a remarkable explosion of exhaust and sound, the 32 cylinders of two Model 251 prime movers quickly get the heavy 27-car train out of town, moving up the mountain on the same tracks that once saw huge DL&W 4-8-4 Poconos, as well as the road's premier *Phoebe Snow*.

Fresh from the paint shop, so fresh in fact that the nose herald has yet to be applied, C636 3643 (top left) basks in the morning sun at Bridge 60 in Scranton, Pa., with M636 3642 on May 7, 2006. Lettered for its Falls Road assignment, RS11 1802 (lower left) rests at Medina, N.Y. Freshly painted RS32 2035 leans into the curve at Lehigh Summit, Pa., with RS3 4103 and the westbound Portland Turn.

After spotting the loads at their customers' sidings, the D-L crew returns to Scranton and ties up after a long day. In 2009, a colorful variety of 39- to 44-year-old Alco diesels running on several freight trains all in one day may seem like a dream, but it's not. This is just another day at work for Genesee Valley Transportation. David Monte Verde, Mike Thomas, and John Herbrand formed GVT in 1985 to provide rail consulting services and to purchase and lease equipment. GVT, which operates a system stretching from eastern Pennsylvania to Upstate and western New York, entered railroading

>> For a complete Genesee Valley Transportation roster, visit www.TrainsMag.com

in earnest four years later when it won a bid to lease three miles of Erie County-owned track. GVT formed Depew, Lancaster & Western to operate over the former Delaware, Lackawanna & Western trackage near Buffalo.

From the beginning, GVT was Alco-powered, with an RS11 and RS3 holding down assignments at Depew. The new DL&W expanded in 1992, when it began operating five miles of former New York Central and Lehigh Valley lines in Batavia. GVT has its corporate offices in Batavia, too, right across from its operational and restored 19th century NYC engine house.

The company's largest acquisitions occurred further east, beginning with the 1990 purchase of short line Lowville & Beaver River, in New York's Adirondack Region. A year later, GVT formed the Mohawk, Adirondack & Northern Railroad to purchase from Conrail and operate 124 miles of ex-NYC lines north of Utica, N.Y. In addition to serving the northern lines, which include a connection with L&BR, MA&N Alcos get to do some high-speed running over 13 miles of trackage rights on CSX's ex-NYC "Water Level Route" main line west from Utica to reach seven miles of its own trackage at Rome.

Genesee Valley began to attract serious attention in 1993 when its Delaware-Lackawanna subsidiary was chosen to operate ex-Delaware & Hudson and DL&W routes north and east of Scranton, Pa. Since then, D-L has grown to an 87-mile railroad, adding more ex-Lackawanna trackage, and even an industrial branch that long ago was operated by electrified interurban Lackawanna & Wyoming Valley. Remarkably, much of this Laurel Line branch, including a 4,900-foot tunnel, is once again electrified, and shared by D-L Alcos and Electric City Trolley Museum's trolleys.

In 1996, GVT purchased Conrail's former New York Central 41-mile route between Lockport and Brockport, N.Y., and established subsidiary Falls Road Railroad to operate it.

Genesee Valley Transportation has suffered little due to the nation's economic woes. Its overall average revenues have remained steady. Although several paper mills on MA&N and the ex-L&BR have shuttered, several other customers keep the Alcos, MLWs and their crews busy out of Carthage, Utica, and Rome. In fact, MA&N's 2008 business levels were up slightly over the previous year. GVT has made gains on other lines as well. A new ethanol plant on the Falls Road brings in 65-car unit trains of corn. Operating with run-through CSX power, this business has bumped Falls Road traffic by better than 200 percent. Grain, propane, and lumber continue to keep the Delaware-Lackawanna busy, too.

Why Alco?

GVT President David Monte Verde says of Alcos: "They were cheap and available." But, he acknowledges, "there is a little sentimentality, of course."

Genesee Valley is one of a handful of American regional railroads that has benefited from buying low-priced

Skirting the banks of the Delaware River, Mohawk, Adirondack & Northern C425 2456 and M420 645, both in BC Rail green, lead M630 3000 and the westbound Portland Turn through Delaware Water Gap, Pa., on April 9, 2006.

Alco exhaust dusts the rusted remains of DL&W signals as RS3 4103 in D&H-inspired paint and RS32 2035 in Genesee Valley colors accelerate through Moscow with a light Portland Turn on May 28, 2006.

Alco locomotives for its operations in New York and Pennsylvania. Starting with several RS11s that Central Vermont was retiring in the 1980s, GVT has flung its net far and wide to buy the best available Alco and MLW power.

GVT Vice-President Michael Thomas has purchased dozens of Alcos over the past quarter century. He has coped with what he calls a "tertiary market," as Class I railroads and other large railroads long ago set aside their Alcos. His purchases often came from equipment dealers, terminal companies, private owners, and short lines. Canada's BC Rail provided a number of Alcos and MLWs to Genesee Valley. But most of the fleet has come from careful research of track-worthy candidates. "Right now, we are not in an acquisition mode," he says. But that doesn't mean that the company won't pick up a promising engine, if it becomes available. He says that GVT works with many regionals and short lines, so "we know where they all are."

Even in better economic times, pre-owned Alcos are a good deal, Thomas says. A 2,000-hp Schenectady product can be purchased for a fraction of the price of a secondhand EMD GP38. Even in today's economy, 4-motor EMDs command premium prices. Thomas says that a low-price Alco can be purchased and rebuilt for much less than the price of a GP38 or GP40. Also, Alcos are more fuel efficient than EMDs, he says.

Many of GVT's locomotive purchases wouldn't have found interested buyers elsewhere, but the railroad brings them back to life. An almost-certain deal breaker for Thomas, though, is any locomotive with worn wheels. Replacement wheels and traction motors can push the cost of a rebuild up an extra $50,000, which just about eliminates the cost benefit of buying an Alco.

Thomas recalls keeping careful track of GVT's former Penn Central C636 No. 3642 during its many years of working at a terminal railroad in Stockton, Calif. As GVT prepared to run heavy trains on the Pocono main, Thomas worked a deal in which an ex-Union Pacific GE C30-7 replaced the Alco in California, and the big Century returned East. Thomas has accumulated an impressive collection of smaller Alcos. "We love the C425s," he says, praising their sturdy model 598 main generators, and commending the locomotives' "rugged nature." Over the years, many GVT Alcos have come and gone. The company retains the best and most suitable units, sells others, and uses the worst as parts donors. A walk through the weeds along the storage line at the South Scranton shops can be both inspiring and depressing to an Alco enthusiast. Some locomotives await business rebounds, while others are slated for the next space inside D-L's compact three-stall shop. But several will never run again, and their parts enable their sister units to enjoy longer lives.

The ranks of active GVT Alcos range from a single 1,000-hp, S6

switcher up through the trio of 6-motor units. In between are three RS3s, three RS11s, an MLW RS18, a pair of rare RS32s, two C420s, two MLW-built M420s, and eight C425s, Thomas' favorite. Six of the 2,500-hp Centuries are original EL units acquired after spending two decades working for BC Rail. Another started life on the Spokane, Portland & Seattle, and the eighth and most recent C425 acquisition rolled out of Schenectady as Pennsylvania Railroad 2423. GVT is working to add a one-time Wabash C424 to the fleet.

Two oddball locomotives on the roster are an extremely rare and historic Electro-Motive SC model switcher, and a tiny GE 44-tonner. Pre-dating the opening of Electro-Motive's legendary LaGrange, Ill., facility, SC No. 426 was constructed at GE's Erie, Pa., plant in 1935 as Delaware, Lackawanna & Western 426 and is currently displayed at Steamtown. Built in 1950 as Skaneateles Short Line No. 6, L&BR 44-tonner No. 1951 is still on duty on the MA&N.

The big 6-motor Alcos may appear to be a bit excessive for a regional railroad, but they are very useful, Monte Verde says. Prior to Conrail's closure of the old DL&W main line as a through route, pusher locomotives often helped heavy eastbound freights up the Pocono grade from Scranton. Today, D-L's revenues are boosted by Harvest States' grain mill over the mountain at Pocono Summit. Grain is a heavy commodity, and the big engines are a natural for moving the unit trains that arrive over Canadian Pacific's former Delaware & Hudson. The ruling grade from the valley floor in Scranton to the crest at Lehigh

Wearing Erie Lackawanna colors that honor its EL heritage, C425 2461 switches at Scranton on Feb. 16, 2009, while 6-motor sisters wait in the wings.

Summit, a grueling 19-mile haul, is 1.8 percent. Watching a set of 6-motors attack the mountain, by themselves or mixed with their four-motor kin, is an experience to behold.

The GVT roster may seem large for a 300-mile regional, but the system prudently keeps two units at each of DL&W's remote operations and on the Falls Road. Five more locomotives cover the two bifurcated ends of the MA&N. Delaware-Lackawanna, the busiest of the company's operations and home to the GVT shop, has the most locomotives on hand at any time. Monte Verde adds that units with dynamic brakes are essential on the Pennsylvania operation. Engines without that capability generally are assigned to the flatlands of western New York.

GVT's official paint scheme is a bright white and gray based on an early Alco demonstrator scheme, according to Monte Verde. White on an Alco? Despite working long, hard hours, GVT-painted Alcos and MLWs are kept looking good. Other color schemes recognize heritages: Three ex-Delaware & Hudson RS3s are painted in their original D&H black with yellow striping, but lettered for D-L. Similarly, a pair of one-time EL C425s carry original colors. Three other ex-EL C425s, usually assigned to the MA&N, still wear previous owner BC Rail's earlier two-tone green in recognition of the road's forest-supported industries, Monte Verde says.

Scranton-bound on its namesake Pocono Mountain Route, C636 3642 leads M630 3000 and the Portland Turn into a curve east of Cresco, Pa., on July 5, 2009.

Thomas Lambrecht

Matt Martin

Fall colors complement the fresh corporate dress of S6 1044 (above) strolling through the woods at Batavia, N.Y., in November 2008. At left, former-Duluth Winnipeg & Pacific RS11 1804, lettered for Depew, Lancaster & Western, stands outside the Falls Road shop in Lockport, N.Y.

The Alco doctor is in

Every successful Alco road has its "Alco Doctor." Genesee Valley's is Chief Mechanical Officer Donald Colangelo. With an eight-member, staff covering Scranton, Utica, and Batavia, Colangelo works wonders restoring and keeping elderly Alcos healthy. "We no longer have Colonie and Hornell," he says, referring to former railroad shops known for their Alco expertise. "Our little three-stall shop does it all. We have no choice."

A former advertising man and sound technician with an interest in mechanics and railroading, Colangelo took a new career direction to work on an eclectic fleet of 539-engined Alco switchers (plus one GE and one EMD) at City Steel in Claymont, Del., for three years starting in the late 1980s. Colangelo also performed contract mechanical work for several small railroads, and soon was learning all about larger 244- and 251-powered Alco road locomotives. He started with GVT in 1995.

Colangelo speaks of learning from Alco greats George Hockaday and Chris MacDermot. "I just listened. I paid attention." The guidance has proven invaluable, as anyone who has seen GVT's fleet can attest. "People used to say bad things about Alcos. But if you do what you're supposed to, they're going to run." Preventive maintenance is key, Monte Verde explains. "We are proud to not have many road failures."

Although a visiting fan might groan to discover a GVT train led by a tattered Alco carrying vestiges of earlier owners' colors, that locomotive is more than likely in better condition than many beautifully painted locomotives elsewhere. A good example is C420 No. 405, which for years wore the dark maroon scheme of previous

"The flagship of the railroad," C636 3642 has received a major engine overhaul, its first in over 30 years. On July 5, 2009, the big Alco and M630 3000 work Scranton-bound road freight PT97 through the Delaware Water Gap.

operator Indiana Hi-Rail with faded lines revealing the colors and lettering from its Delaware & Hudson and Lehigh Valley past. Scheduled for its turn in the paint shop this year, Colangelo and D-L engineers agree that it is one of the railroad's better locomotives.

GVT's most recent roster addition, C425 No. 2423 is a similar case. The unit entered service this past spring wearing the worn blue-and-yellow colors of previous owner, New York & Lake Erie. But under the 44-year-old Alco's rough exterior beats the heart of a 21st century locomotive. Before 2423 hit the road, Colangelo and his team updated and replaced much of its low-voltage control wiring (bringing it to AAR standards so it can run in multiple with Canadian Pacific run-through power); renewed or replaced all worn pipes, hoses, and couplings; installed a rebuilt GE 598D2 generator; added a new computerized engine temperature control, low water alarm, and a Woodward "fuel limit" governor; and installed a new cab floor, seating, FRA glazing, an event recorder, alerter, and end-of-train telemetry. The former-Pennsy Century waits it turn for painting.

"If a locomotive can make it here in interchange, we can fix it," Colangelo says, citing GVT's latest restored RS3, D-L 4068, as an example. Located in Canada a couple of years ago, the unit's Alco 244 prime mover would not turn over. Eight weeks after arrival at South Scranton, 4068 was running.

Meanwhile, other members of the GVT fleet are receiving serious attention in the South Scranton shop. Veteran C636 No. 3642, already running well and resplendent in its white-and-gray GVT paint, has received a major engine overhaul. GVT purchased the engine after it worked for many years in patched Conrail blue in California. Colangelo refers to the 3642 as "the flagship of the railroad ... one of our best pullers." But, he says, "as far as we can see, the last major monies spent on the engine were by Conrail in early 1978." The locomotive had its original flat-top pistons replaced, and received new cylinder liners, piston pins, piston rings, rebuilt or new heads as required, rebuilt fuel pump supports, three new camshaft sections, new low-water alarm, and a new fuel injector.

In 2009, four decades after Alco closed its Schenectady plant, it is remarkable that Genesee Valley still purchases brand-new model 251 engine blocks. And the company has found a vendor that will rebuild main generators. Getting needed parts is not a major problem, Colangelo says. The railroad maintains an inventory of "high-mortality rate" components, usually replacing many when a unit receives routine servicing.

Cautious engineers on many railroads tend to treat an elderly Alco very gently, almost fearful that too much stress could mean an unfortunate end for the unit. Colangelo scoffs, saying if the locomotive is properly maintained there is no reason to hesitate to pull the throttle all the way back to the eighth notch when power is needed.

And anyone fortunate enough to witness GVT's trio of operating RS3s — something that can be seen and heard nowhere else in the world in 2009 — taking a train up the hill from Scranton will understand that the D-L engineers obviously take Colangelo at his word. ℐ

CAB FORWARD, TAKE TWO

Story and photos by Ted Benson

SP's signature Tunnel Motors

In a steam-powered world filled with individuality, Southern Pacific locomotives stood out at a glance. Visored Pyle-Nationals, train indicators, skyline casings — all instantly screamed "Espee." It took all of five seconds to filter five flavors of Daylight 4-8-4s. Class distinctions between flat-front AC-6 cab-forwards and "streamlined" AC-7 Articulated Consolidations were as discernible as night and day.

The same held true for diesels. Three different diesel-hydraulics and 40 pounds of headlights hung on two generations of hood units made the point perfectly clear. And when it came to power as unique and reliable as a cab-forward Malley, nothing surpassed the tunnel motors.

Electro-Motive customers had specific demands for heavy freight-haulers in 1966: locomotives that could "run like a race horse and drag like a mule." Six years and an industry-leading 356 SD45s later, SP made a third request: 3,600-hp units that could breathe in the tunnels and snow sheds peppering the Golden Empire's mountain crossings. La Grange responded with 247 SD45T-2s, the first 6-axle units in EMD's Dash-2 model line.

On a railroad where the mules dragged "everything but the yard office," EMD solved the oxygen-starvation problem with a "see-through" radiator plenum, creating a diesel profile as distinctive as any cab-forward steamer. Equally at home in Tucumcari and Truckee, Tunnel Motors roamed Southern Pacific for the carrier's last quarter-century. Eventually the roster numbered 486 as fuel-friendly SD40T-2s supplemented the big-block EMDs. In 1986, SP began rebuilding high-mileage V-20 units. Some 126 SD45T-2Rs were on the property when Union Pacific took control a decade later.

On April 11, 1989, the possibility of a paycheck signed in Omaha was the last thing on the mind of the Roseville dispatcher watching track occupancy lights glow on the CTC panel between Chorro and Goldtree, Calif., 248 miles south of San Francisco on SP's fabled Coast Line.

Nothing said "Southern Pacific" like a sugar beet train and today's edition of the Tracy-Guadalupe "East Beets" presented a dizzying spectacle of wood and steel uncoiling on four planes of focus as Extra 6842 East traversed the oft-remarked horseshoe curve above San Luis Obispo.

Safe passage across Cuesta's 2.2 percent ruling grade was entrusted to the 15,800 collective horses of "T-2" rebuild 6842 and 20-cylinder sister 9311 leading three SD9Es and two GP38-2s on the TRGUU. Another 11,000-hp helper led by sister SD45T-2R 6818 anchored the rear end of 7,558 tons of sucrose-saturated vegetable matter riding the plain bearings of 78 venerable GSS composite gondolas.

For the lone photographer focusing a 300mm telephoto lens atop a low hill below Goldtree, the images flashing across 36 frames of Kodachrome 64 validated months of anticipation. For Coast Line railroaders, it was just another day's work, an enterprise ensured by some of the most-distinctive diesels in the West. ℐ

TUNNEL MOTOR TRIBUTE

EMD's SD45T-2 and SD40T-2

by Joseph A. Strapac

Working through Troy, Calif., in the Sierra Nevada territory that inspired their design, a trio of tunnel motors, two SP and one Rio Grande, lead a westbound manifest in August 1984.

Dick Dorn

Rarely, in these times of mass-produced diesel locomotives, have builders agreed to custom-design a locomotive to meet a particular railroad's need. The late 1970s collaboration between General Motors' Electro-Motive Division and Southern Pacific produced one of the rare, and most successful exceptions to the rule: the SD45T-2 and SD40T-2. The "T" stood for tunnel.

At the height of the 1960s horsepower race, SP embraced EMD's 20-cylinder, 3,600-hp SD45 with unparalleled enthusiasm. The SD45 quickly became tonnage-oriented SP's standard locomotive, with purchases between 1966 and 1971 totaling 356 SD45s and another 10 SDP45

Mike Martin

Dick Dorn

At Taylor Yard in Los Angeles (center), SD45T-2 9369 keeps company with U50 9950 in April 1977. Battling the Donner Pass winter, a trio of SD45T-2s team with SD9 4319, an F7B snail, and paired rotaries plowing past Switch 9 in March 1982.

Dick Dorn

A picture is worth a thousand words. Mid-train helpers, including SP SD45T-2 9213 and five EMD kin exit Tunnel 41 at the summit of Donner Pass in a smoky explosion of heat and exhaust that in a single frame of celluloid explains the Southern Pacific's quest for the tunnel motor design.

passenger variations. Indeed, SP and subsidiary Cotton Belt accounted for more than 28 percent of the model's total 1,260-unit production run.

On Electro-Motive's ledgers, SP's fleet translated to a billion dollars worth of locomotives, purchased by just one customer.

Despite this investment, SP was not yet satisfied, and EMD was open to the kind of engineering innovation it would have shunned a decade earlier. SP traditionally operated slow, heavy freight trains at the outside limits of locomotive performance, demanding more than even the SD45 could produce. Over the strenuous objections of the locomotive builder, SP loaded down its gleaming new SD45s to the point that they were expected to drag trains over the Sierra Nevada mountain range at 7 to 8 mph, through a procession of tunnels and snowsheds, with their power ammeters pegged. From the locomotive builder's standpoint, this was analogous to running your auto engine in a closed garage. Those SD45s were being forced to inhale hot radiator air and engine exhaust fumes while operating in conditions that put them under the greatest possible stress.

A custom feature to address SP's operating problem

Heat is the locomotive's enemy. A by-product of the energy generated (only some of which is used by the locomotive to power its train), damaging heat can accumulate in the wrong places at the worst possible times. Furthermore, the harder the locomotive is working, the more difficult it is to exhaust excess heat into the atmosphere.

Southern Pacific spent millions of dollars to improve the diesel locomotive, frequently signing orders sight-unseen for "the next big thing" in locomotive technology. SP was a vital force in the revolutionary motive power developments of the 1960s and '70s, often challenging the locomotive builders, but placing orders for hundreds of new locomotives.

The locomotive industry listened to Southern Pacific, but the concept of "tunnel motor" radiators did not arrive in a flash.

Engineers had long known that lower air intakes delivered cooler air to the radiators. In the 1940s and '50s, Baldwin built its roadswitchers with low-level air intakes. General Electric adopted a similar airflow plan for its U-series locomotives. SP had to modify its first hydraulic-drive diesels after realizing that even these exotic machines were suffering engine damage from hot air ingested at roof level in tunnels and snowsheds.

Electro-Motive was committed to high-intake radiators for its hood units, but designed each more powerful

>> For a complete tunnel motor roster, visit www.TrainsMag.com

Craig Walker

Passing the converted caboose serving as a train order office at Hiland, Calif., on Aug. 25, 1976, SD45T-2s 9304 and 9248 bracket an SD45 and a two U33Cs as they grind up Cajon Pass with a westbound drag.

model of SD locomotive with larger radiators than its predecessor, finally tilting them out on the SD45 in a broad "V" alignment. The SD45 sold well across the country with few customer complaints regarding cooling. (Rio Grande installed a water-spray system on the radiators of its SD45s to supplement cooling in tunnels.)

However, the SD45 was engineered to operate at a "minimum continuous speed" to protect the traction motors from overheating. Once the cooling-water temperature exceeded a preset level, the engine-protection thermostat reduced the amount of fuel metered by the fuel injection system, cutting back the horsepower the engin delivered. EMD argued that SP was not taking advantage of the SD45; if SP would only operate its SD45s in tunnels or snowsheds at 20 mph (instead of 7), it would never suffer horsepower reduction incidents.

Southern Pacific's operating philosophy clashed with EMD's position that an increase in a given locomotive's horsepower inevitably resulted in a higher minimum continuous speed. SP equated greater horsepower with the ability to haul longer trains, not necessarily operate trains of the same length at greater speed.

"Horsepower is horsepower," claimed SP, and set out to prove its point, first by investing millions in the diesel-hydraulic locomotive project, then by running dynamometer tests with General Electric U33C units over the Sierras. The GE unit, with its low-level radiator air intake, did not "de-rate" under conditions that would cause an SD45 to cut back its output to keep the engine from overheating.

La Grange is listening

This lesson was not lost on Electro-Motive. SP could simply define the U33C (or the imminent U36C) as its mountain locomotive of choice and purchase U-boats instead of SD45s. EMD needed to start from scratch and determine what could be done within cost limits to modify the SD45's radiator air flow. To limit cost, EMD first proposed the SD45T, which hid the radiator cores inside the hood in a narrow V, retaining traditional pull-through radiator fans atop the roof.

The notion of an SD45T pointed in the right direction, but the proposed layout restricted airflow and forced the radiators into too small a space. EMD finally decided to re-engineer the entire "radiator cab" portion of the hood (as had been done to accommodate a steam generator on the SDP45), moving equipment forward and providing space for a large screened plenum area below push-through fans. The radiators themselves would be located on the top of the hood. This solution, while more costly than the SD45T, was seen as solving the air-cooling problem once and for all.

Meanwhile, EMD rolled out the SD45X, an engineering prototype

Craig Walker

Bicentennial colors of Cotton Belt 9389 bear evidence of the rigors of road service as the red-white-and-blue SD45T-2 pauses at Colton, Calif., in December 1977.

that introduced re-designed trucks and electrical gear. SP purchased three SD45X testbeds in late summer 1970, and found much to like about them, but their even-larger radiators displayed the same handicap in tunnels and snowsheds as did the SD45. The SD45X, a precursor to EMD's Dash-2 line introduced in January 1972, was never catalogued.

EMD kept Southern Pacific, with its substantial investment in standard-radiator SD45 locomotives, informed of model debut schedules. Once told the specifics of EMD's pending Dash-2 designs, SP put further SD45 purchases on hold. The road's last new SD45s, Nos. 9140-9151, entered service on March 30, 1970. SP continued to purchase GE U33Cs until January 1975, if for no other reason than to keep alive its challenge to EMD.

In parallel with development of its production Dash-2 line, EMD and SP engineers were hammered out details of an optional radiator arrangement for a new locomotive model: the SD45T-2. The "T" modification departed from the stock SD45-2 at a walkway-to-roof vertical seam in the hood behind the dynamic brake blister. Modifications to the rear of that seam provided for re-arranged internal components, a large fresh air plenum, and distinctive see-through grilles. To accommodate the T-2's larger, roof-mounted radiators, the hood was extended as far back as possible, virtually eliminating the "back porch" and necessitating vertical side ladder steps at the rear instead of the usual stairs. Reportedly, these modifications added about $19,000 to the base price of an SD45-2.

For its part, SP bought in, and bought often. When 43 units of the road's initial SD45T-2, SP 9166-9208, order began rolling out of La Grange in February 1972, they were among the first Dash 2s built. By the end of 1972, SP and its Cotton Belt subsidiary had purchased 104 SD45T-2s. Ultimately, the road would amass a fleet of 247 of the 3,600-hp T-2s, 64 of them carrying Cotton Belt lettering. SP would be the only purchaser of the model, but the SD45T-2 was just the beginning.

SP SD45T-2 9327 draws a crowd as it shoves an eastbound drag into "the biggest little city in the world."

Dick Dorn

Craig Walker

Their train wrapped around the Tehachapi loop, SP SD40T-2 8305, a U33C and an SD45 exit Tunnel 9 at Walong in August 1977.

Success ... and a successor

Given the success of the SD45T-2, a tunnel motor version of EMD's best-selling SD40-2 was a natural. The SD40T-2 made its quiet debut in summer 1974 with the delivery of two small orders numbered SP 8300-8306 and 8350-8356. The first seven units were outfitted as Locotrol master units, while the second seven were equipped as Locotrol receivers for unmanned remote helper service. Despite its slow start, the SD40T-2 would ultimately outsell its big brother. SP signed up for a total of 247 SD45T-2s (183 SP and 64 Cotton Belt), while SD40T-2 production totaled 312, and included the only non-SP tunnel motor sales. In addition to 229 SP and 10 Cotton Belt SD40T-2s, Rio Grande ordered 73 of the 3,000-hp tunnel motors, boosting production to 312 units.

All 73 Rio Grande SD40T-2s adhered to one general specification, but details often changed from order to order. For instance, D&RGW tested and then embraced the PTC wheel-slip control system, adding its "black box" to 1970s-era EMD Dash-2 electrical cabinets. Industry sources cite a cost of around $25,000 per unit for materials, as well as something close to 100 man-hours to install. As far as Rio Grande locomotive purchases were concerned, the PTC-equipped SD40T-2s were a great success. The railroad found little to supplant these units in the last decade and a half of its corporate existence. The SD50s that were one of the road's last locomotive purchases prior to the SP merger were originally ordered as SD40T-2s.

Mike Martin

A faded reminder of the ill-fated SP-Santa Fe merger plan, SP 8286 and an SD40T-2 quartet working the eastbound TankTrain over the Tehachapi Mountains at Bealville, Calif., in October 1992.

Scott Snell

Rio Grande's 73 SD40T-2s were the only tunnel motors built for a railroad other than Southern Pacific. In January 2001, DRGW 5390, 5371, and 5389 pass through Utah's Price River Canyon near Kyune, Utah.

Recapitalization of the SD45T-2

Between 1986 and 1989, SP's entire fleet of SD45T-2s became fully paid for and thus, no longer eligible for tax deductions as depreciating capital equipment. This, at the very time when their maintenance requirements were multiplying. They were saved from an uncertain fate by favorable accounting rules and tax breaks.

In a complicated arrangement driven by tax laws, accounting rules, and labor agreements, Southern Pacific Equipment Co. purchased the locomotives, paid the railroad to remanufacture them, then leased the rebuilt locomotives back to the SP. The equipment company paid different labor rates for the same work (in the very same shop building) than the railroad itself would have to pay, hence SP's use of the term "upgrading" to describe this work. It was technically contract remanufacturing for a customer and not ongoing maintenance for the railroad.

Taxation rates were different, as well. Non-railroads paid slightly lower taxes on the same equipment and services, making it worthwhile to sell a locomotive to a non-operating subsidiary and then lease it back to take advantage of a re-started amortization calendar.

SP initiated its SD45T-2R upgrading program in 1986, and returned 126 SD45T-2 locomotives to active service. The 1986 program ran April-December and included 26 units numbered 6767-6792. In 1987, SP budgeted 36 locomotives, one to emerge every 10 days, carrying road numbers 6793-6828. The 1988 program reached a peak of 40 units assigned numbers 6829-6868. In 1989, SP completed only two dozen SD45T-2R locomotives, Nos. 6869-6892, before formally shutting down the program at the end of the year.

Shop workers selected locomotives for upgrading based on their condition, with those in better shape going through first because they'd require fewer repairs, which would also keep production costs under control. SD45T-2Rs 6767-6868 emerged with Southern Pacific lettering, while Nos. 6869-6892 boasted Cotton Belt.

SP's intent was to upgrade to "better than new," and features and accessories that had caused grief over the years were the first to go. Engineers continually tweaked basic specifications in order to achieve more effective performance at lower cost, resulting in slightly different specifications as production evolved. The goal was to turn each locomotive back to zero time on major wearing parts, add internal improvements that weren't budget-busters, improve maintainability, and re-capitalize each unit to gain depreciation cost benefits.

Steve Smedley

Still in SP paint a decade past its UP retirement, CEFX SD45T-2 9395 races eastward on Toledo, Peoria & Western at Secor, Ill., on June 1, 2009.

Tunnel motor twilight

The 1988 union of Rio Grande and Southern Pacific brought the entire tunnel motor population under the flag of the newly formed Southern Pacific Lines. Less than a decade later, Union Pacific, which never purchased a new tunnel motor of its own, inherited the lot with its acquisition of SP in September 1996. UP embraced the aging motors and several groups, particularly SD40T-2s, were included in rebuild and upgrade programs. However, the SD45T-2s and their fuel-guzzling 20-cylinder 645s quickly fell from favor. UP began retiring them *en-masse* by 1999. In 1998-'99, 40 were rebuilt with 16-645E3 engines at VMV in Paducah, Ky., but even these have since been retired.

A few of the 20-cylinder beasts labor on in lease fleets, particularly CEFX, which found an unlikely but lucrative market for the units (still in SP colors) on Midwestern regional

Elrond Lawrence

Strolling through the streets of Santa Cruz, Calif., on July 26, 2005, UP 2842, a former-Cotton Belt SD45T-2 rebuilt with a 3,000-hp, 16-645, leads a pair of GP40-2s and the northbound Santa Cruz Local past the boardwalk. On Jan. 31, 2009, three of Bessemer & Lake Erie's 10 3,000-hp SD45T-2 rebuilds work southbound taconite ore near Meharg, Pa. Lead unit 902 rolled out of La Grange in March 1972 as SP 9189, the 24th unit of the original tunnel motor order.

J. Alex Lang

Jeff Terry

Otto M. Vondrak

carriers. Others went to the likes of Kansas City Southern, Bessemer & Lake Erie, and Duluth, Minnesota & Iron Range, which followed UP's lead and had the '45Ts re-engined with 3,000-hp, 16-645E3 engines. Time is catching up with these survivors, too. Canadian National has retired more than half of the 18 DM&IR SD45T-2 rebuilds, yet others have received fresh coats of CN paint. While a few SD40T-2s linger on UP's roster, they too have migrated by the dozens to new homes, from KCS to Central Oregon & Pacific; Ohio Central; New York, Susquehanna & Western; R.J. Corman, and others, as well as in lease fleet service nationwide.

Although the economic downturn has hurt their fortunes, it's unlikely that the final chapter of the tunnel motor story will be written any time soon. It is, however, all but guaranteed that they'll play out their careers far from the Sierra Nevada snowsheds and tunnels that inspired their creation. ▮

Two of 18 DM&IR SD45T-2 rebuilds CN inherited (left) buck through the snow at Highland, Minn., in December 2005. CN has since retired more than half of the Missabe motors. NYS&W 3012 (above), one of four secondhand SD40T-2s Susquehanna acquired leads a Maplefest excursion at Cortland, N.Y., on April 6, 2008. Far from Sierra Nevada snowsheds and tunnels (below), R.J. Corman SD40T-2 8718 leads coal train RJC-3 into the Shawville tunnel on onetime New York Central trackage north of Clearfield, Pa.

J. Alex Lang

LAST HURRAH

For An Old Warrior

Story and photos by Elrond Lawrence

Swan songs are part of our culture, the stuff of myths and legends. We all want one final opportunity to root for our aging heroes before they pass into history. Rocky needs to score one last knockout, Randy Johnson needs to pitch his 300th win — and how many band reunions have we embraced?

So it goes for the machines that awed us in our youth. In the 1980s it was impossible to imagine the great Southern Pacific without its signature SD40T-2 and SD45T-2 locomotives, affectionately known as "tunnel motors." But now their ranks have thinned and seeing one today in mainline action is a special event. That's why the afternoon of Nov. 30, 2007, will live forever in the memories of fans along Union Pacific's Coast Subdivision between Oakland and Los Angeles. A call from photographer Alex Ramos alerted me that Amtrak's southbound *Coast Starlight* had suffered an engine failure, and the emergency replacement was SD40T-2 No. 8683. A survivor of the UP-SP merger, the 8683 first rolled off the EMD assembly line in 1978 as Southern Pacific No. 8307, one of 84 units equipped with extended 116-inch noses to work in radio-controlled mid-train helper service. The venerable SD40T-2 was renumbered UP 8683 in February 2002, but retained its traditional scarlet and gray colors, and — amazingly — its trademark "SP" nose letters.

Leaving my home in Salinas, I decided to catch the southbound *Starlight* north of town, on a stretch of Coast Line still guarded by Union Switch & Signal Co. searchlight

Framed in the depot breezeway (above), SD40T-2 8683 brings Amtrak No. 11, the *Coast Starlight* into Salinas, Calif. "B Unit Do Not Occupy" stenciling on the rear cab window (at right) failed to prevent a shining moment for an old warrior.

On Nov. 30, 2007, time marches backward as SD40T-2 8683, renumbered after the UP merger, but otherwise all-SP, leads Amtrak's *Coast Starlight* past iconic Union Switch & Signal Co. searchlight signals north of Salinas.

signals dating back to the steam era. While lining up the shot, No. 11's headlight appeared on the horizon. Like a battered destroyer brought out of mothballs, No. 8683 was indeed leading Amtrak's flagship train down the California Coast, and doing so with a vengeance. A lone Nikon shutter clicked furiously as the imposing tunnel motor split the old searchlights and roared past.

Heading back into town, I quickly discovered that a red block had halted the train at North Salinas siding. Beauty shots were duly taken, followed by a slow roll past another pair of searchlights. As I paced the train into town, an unexpected swell of emotion struck: Surely this was the last time a tunnel motor would ever lead a mainline train down the Salinas Valley. At the depot, I was able to enjoy a quiet moment before the big EMD throttled up and left John Steinbeck's home town behind.

Pointing her 116-inch scarlet snoot toward Los Angeles, UP 8683 parades out of Salinas.

One year and five days later, on Dec. 5, 2008, UP retired No. 8683 after a 30-year career. But its triumphant run down the Coast Line, its "last hurrah," was a shining moment that every warrior deserves. T

HELPERS

BATTLE HORSESHOE CURVE

Story and photos by M. Ross Valentine

"The grade, by itself, is not the challenge. It is the combination of grade and traffic."

David P. Morgan, "The World's Busiest Mountain Railroad," April 1957 TRAINS

Holding down the rear of an eastbound ore train heading into the tunnel at Gallitzin, SD40E helpers 6312 and 6313 provide braking power on the steep descent to Altoona.

More than a half-century later, on what is now Norfolk Southern's Pittsburgh Line, the words of TRAINS magazine Editor David P. Morgan still ring true. For NS, the 113.8 miles of former-Pennsylvania Railroad main line between Pittsburgh and Altoona, Pa., present, as they have throughout history, a challenging combination of high-density traffic and a steep, twisting piece of multiple-track mountain railroad that sees an average of 40-60 trains per day — even more when economic times are better.

There are few places where history, tonnage, heavy traffic, and the forces of gravity come together as they do on the Alleghany grades of what Morgan dubbed the world's busiest mountain railroad. In Altoona, at the foot of the mountain, helper locomotives have been an omnipresent element of that history. Their struggle to shoulder tonnage up the east slope of the Alleghenies, and around the famed 180-degree Horseshoe Curve in the process, is epic.

Consider how many places steeped in railroad lore have changed so drastically that one can hardly identify

(Top) From its pedestal in the park, preserved PRR GP9 7048 looks on in silence as SD40Es 6313 and 6312 shove a westbound intermodal around Horseshoe Curve on May 22, 2009.

them. Manned helper locomotives, once a staple of mountain railroading, are becoming a rare commodity. The combined effect of A.C. traction and higher-horsepower locomotives has raised the bar on operational requirements for helpers. In many cases, it's cheaper to place an unmanned DPU on the rear of a train and let it run to the next terminal 200 miles away.

But not in Altoona, the largest bastion of helper locomotives left in the country. Sure there are other places where manned helpers operate, but none with the intensity found in the territory between Altoona and Pittsburgh, where as many as 10-12 sets can be on the road at a time.

Striking west from Altoona, the abrupt grade, a ruling ascent of 1.85 percent with stretches as steep as 2.28, makes helpers mandatory. However, the steepest climb (12.4 miles on the East Slope) is relatively short, making the long-haul economics of DPU operation less attractive.

Since the Conrail era, Altoona helper assignments have been held down by SD40-2s. But, that's about to change. There's a new breed of helper on the mountain. Meet the SD40E.

Altoona built: The new thoroughbreds

In the great Pennsylvania Railroad tradition of steam-era power on Horseshoe Curve, from high-stepping 4-4-0s and E-2 Atlantics, to plodding 2-10-0 "Hippos," the new thoroughbreds assigned to helper duties on the mountain are Altoona-built. The SD40E — E for EM2000 micro-

With helpers fore and aft, an eastbound coal train with two Conrail-blue SD60Is, passes the position lights at Lilly, Pa., on May 16, 2009. Head-end helpers are SD40-2s 3338 and 3353. Bringing up the rear are SD40Es 6305 and SD40-2 3344.

processor — is a creation of Norfolk Southern's Juniata Locomotive Shop; the same shop that turned out Pennsy steam, from tiny 0-4-0s to famed K4 Pacifics and giant 4-4-4-4 T1s.

While retaining their classic EMD lines, the 6300-series SD40Es are essentially brand-new locomotives, stripped to the frame and rebuilt from

the rails up with new or completely remanufactured components. The work includes a rebuilt EMD 16-645E3 engine rated at 3,000 hp, for greater fuel efficiency and reliability, an auxiliary power unit, a new cab interior (with air-conditioning), cab signals, Locomotive Speed Limiter, and Helper Link equipment.

An electronic system devised to allow helpers to uncouple from the trains they are assisting without first bringing the train to a stop, Helper Link establishes braking communication and continuity between a train and its helpers without a physical train-line connection. The system preserves all operational and safety features of continuous train-line air, but the lack of an actual train-line connection allows helper locomotives to uncouple at speed from the train they are assisting.

Even in these hard times, the helper pool includes nine assigned jobs and 18 unassigned jobs based in Altoona. There are usually four helper crews working at any given moment, but as many as 10 to 12 helper sets can be on the road simultaneously if traffic warrants. Helper crews are based at Rose Yard in Altoona, or in Pittsburgh,

Positioned on the head-end of an eastbound intermodal, SD40-2s 3350 and Conrail-blue 3347 roll past the slide-detector fences at Cassandra, Pa.

while the locomotives are serviced at the small enginehouse at Cresson, Pa., 15 rail miles west of Altoona. At the moment, former-Conrail SD40-2s still dominate the helper pool, but the changing of the guard will continue as new SD40Es roll out of Juniata. Not all of the 60 planned SD40Es will be helpers, but the 15 completed to date have been assigned to Pittsburgh Line helper service.

Giving their to all to move westbound intermodal 23M over the mountain, helper SD40-2s 3338 and 3353 climb toward Horseshoe Curve on May 22, 2009.

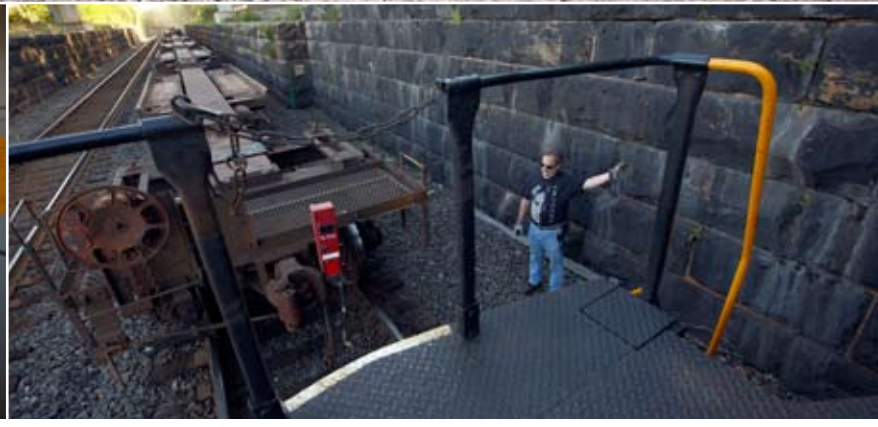
Challenging gravity

The test for westbound trains out of Harrisburg with 3,800 tons or more is speed. If a train is unable to make 35 mph in notch 5 between Spruce Creek and Grey, it requires helpers west of Altoona. Helpers can be on the head end or rear end of the train or both. Depending upon tonnage, power requirements or operating conditions, helpers can cut off at UN in Gallitzin, MO in Cresson, SO in South Fork, but usually continue west to Conemaugh to wait for eastward trains. Heavier westward trains may also keep their helpers as far Wilmerding, or even all the way to Pittsburgh.

Eastbounds have an uphill climb all the way from Johnstown, but helpers have an additional, even more important role: braking power. Trains descending the steep east slope are permitted a maximum of 800 tons per operative dynamic-brake axle without setting retainers, and must not exceed an average of 140 tons per operative brake. Mountain railroading isn't only about getting trains uphill; the true art is controlling their descent. Eastbound trains requiring assistance generally take on helper locomotives at Conemaugh or Cresson.

(Top) Helping eastbound manifest 36A ease downhill, SD40-2s 3433 and 3354 pass the closed interlocking tower at MG. NS 3433 is a Pennsy veteran, built in 1966 as PRR 6082.

Train handling on a mountain railroad is an art form not to be underestimated. On the balmy evening of May 21, 2009, Elizabethport, N.J.,-Chicago intermodal train 23M is in skillful hands. Guided by conductor



SD40E 6304 (far left) is readied for duty at Altoona. Keeping a date with train 23M, engineer Kenny Snively (center photo) eases his SD40-2s past SD40E successors at Rose Yard. At right, Conductor Dave Glunt makes the joint with 23M.

Dave Glunt, engineer Kenny Snively nudges SD40-2s 3353 and 3338 against the rear of the 6,424-ton, 10,327-foot train. Seasoned veterans all: Snively, with 33 years on the job, is a second-generation Altoona engineer. His father was a Pennsy engineman with a steam-era seniority date. Glunt has been railroading for 35 years, and their trusty SD40-2 steeds are of Conrail pedigree, La Grange class of 1977. Riding shotgun, is Road Foreman of Engines Vincent Mucci.

In a ritual as old as mountain railroading, Snively and the road engineer, nearly two miles ahead in the cab of Dash 8-40CW 9478, get 23M on the move. Passing Alto Tower, Snively widens out the throttle, rattling the rafters of the ancient — but still manned — interlocking tower as helpers have done for a hundred years.

Six thousand turbocharged EMD horses lean into the load, and Snively settles back in his seat. Experienced eyes watch intermodal cars ahead trace the curves. The speedometer holds a steady 17 mph. The throttle stays fixed in Run 8. Position-light signals flash by. A friendly toot of the horn and a returning wave to an Amish school group watching 23M from the park at Horseshoe Curve.

Over the drone of laboring 645s, Snively excuses the rough-around-the edges look of his aging EMDs, but as 23M hits the 2.28 percent at Benny without losing stride, and tops the 2,192-foot summit at Gallitzin, no apologies are necessary. 23M has the hard part of the haul to Chi-town behind it.

"This is a locomotive." After helping train 13G to Cresson, Snively and Glunt head back to Altoona with SD40Es 6313 and 6312 on May 22, 2009.

SD40E rebuilds take shape at Juniata in May 2009. SD50 5433, still in Conrail blue (top left) will become NS 6316. At top right and opposite right, shop men work on Nos. 6315 and 6317.

Twenty four hours later, Snively and Glunt are back on the hill for another shift, but they've exchanged their tired 3300s for a pair of pristine SD40Es. Pausing at Cresson after shoving 13G over the mountain, there's time for a few words while they wait for a signal to return to Altoona. "You should be with us tonight," they shout from the sparkling-fresh cab of NS 6313. "*This* is a locomotive."

More than that, it's an Altoona-built locomotive, proudly operated by great railroaders. The Pennsy couldn't have done better than that. ▮

ALCO LIVES!

ALCOS IN THE OZARKS

Story and photos by Jeff Mast

Arkansas & Missouri C420 48 glistens in the morning sun at Springdale, Mo., in July 2008.

On a warm July morning in Springdale, Ark., a pristine Arkansas & Missouri C420 eases past a small station and gently couples to a short string of equally clean, dark green coaches parked in the siding. As crews prepare the train, a regularly scheduled excursion to Fort Smith and back, Nathan horns announce the return of the overnight freight. Moments later, the northbound Fort Smith turn rumbles past with a half-dozen C420s and a pair of MLW M420s lugging a heavy train burdened with gravel and sand loads. Forty years after Alco shuttered its Schenectady works, the spectacle is as remarkable as it is pulse-quickening. But here in Springdale, headquarters of the 149-mile Arkansas & Missouri Railroad, and home to one of the most celebrated preserves of Alco diesels in the land, it's business as usual.

Formed in 1985, A&M operates between Monett, Mo., and Fort Smith, Ark., on former-Frisco trackage spun-off by Burlington Northern. The proudly independent line opted for hand-me-down Alcos with its very first locomotive purchases (a group of C420s of Seaboard and Monon ancestry) and hasn't looked back. Today, as it has been for nearly a quarter-century, A&M is synonymous with six- to eight-unit sets of 4-motor Alcos lugging heavy trains of grain, gravel, and sand through rolling hills

RS32 No. 30 (top) goes to work as the Fort Smith turn power waits in the background. C420 No. 44 (above) waits to head north with the Monett turn.

Nearing Purdy, Mo., on a July afternoon (above), the southbound Monett turn works upgrade with grain for the elevator at Butterfield. At right, five 420s, four Centurys and an ex-CN M420, lean into a curve south of Seligman, Mo., as they head home for Springdale with the Monnet turn.

and over Ozark Mountain grades and putting in a performance as spectacular at the terrain they traverse.

The backbone of A&M's all-Alco fleet has been, and continues to be, the C420. Indeed, with no fewer than 15 units of Lehigh Valley, Lehigh & Hudson River, Seaboard Air Line, and Erie Mining origin, A&M holds title to the largest C420 fleet anywhere. In all, more than 30 Alcos and MLWs call the A&M shop at Springdale home; everything from a 1951 RS1 of Rutland heritage and six notch-nosed T6 switchers of Norfolk & Western and Pennsylvania ancestry, to a rare onetime New York Central RS32; a trio of MLW M420s built for CN and a Bombardier-built, former CN HR412 (all acquired from Ohio Central), and seven C424s. Only two of the C424s, A&M 32 and 34 (former Belt Railway of Chicago 601 and 602) have been repainted and placed in service. The remainder, three ex-BRCs and two former Canadian Pacific units, are stored.

It's a morning ritual in Springdale as the A&M awakens to the arrival of the overnight Fort Smith turn. RS32 No. 30, its spotless maroon paint and polished brass bell glistening in the morning sun, shuffles about the shop while shopmen clamor about the eight inbound units, servicing them and breaking up the consist to assemble the three-unit set that will continue north with the freight to Monett and the BNSF interchange. Standing in the wings, a T6 awaits a call to duty and former-BRC C424 No. 34 shows off its newly applied A&M colors. RS1 No. 20 dozes contentedly and the sweet sound of Alco 251s fills the air as a trio of 420s accelerate toward the yard to pick up their train for Monett.

If there's an Alco heaven, surely this is it. ▮

>> For all of A&M's Alcos, see the roster at www.TrainsMag.com

Steve Smedley

DENIZENS OF DUNLAP ISLAND

Cloquet Terminal's SW1s soldier on

by Steve Glischinski

The fleet is in. Cloquet Terminal's three SW1s and SW1000 No. 35 line up in the road's Cloquet, Minn., roundhouse in October 2006.

In Cloquet, Minn., about 20 miles south of Duluth, there resides a railroad yard on an island in the St. Louis River. It's a model railroaders dream, with an old wooden coach and a boxcar used to store material; wheel-sets stored on rusty tracks and compact yard tracks leading into an engine house that looks right out of the steam era. Which it is. This is Dunlap Island, home of the Cloquet Terminal Railway, better known, perhaps, by its former name, the Duluth & Northeastern.

Once legendary among the steam faithful, Duluth & Northeastern gained fame as one of the last employers of workaday steam locomotives in the U.S. All-steam until 1964, D&NE kept its tiny fleet of four 2-8-0s and a single 0-6-0 in revenue service until a pair of former Elgin, Joliet & Eastern SW1s arrived on the property. In 1965, a third SW1 and an NW2 completed D&NE's dieselzation. When steam bowed out, most enthusiasts forgot about the D&NE and its stable of small diesels. But now, 45 years after steam was replaced, two of the original SW1s remain on the job, and are now as notable as the steam locomotives they replaced. Like many 60-something workers these days, the little EMD switchers haven't retired yet, and have no intention of doing so.

Electro-Motive produced 612 copies of the 600-hp SW1 between 1939 and 1953, although production was suspended in the World War II years of 1942-'45. The SW1 found favor with Class I roads, short lines and industries alike, and toiled anonymously for decades. Milwaukee Road's fleet in southern Minnesota gained some measure of fame in the 1970s as three- and four-unit sets of SW1s were coupled together to handle trains over branch lines with light axle loadings. Long ago banished

Steve Smedley

Earning its keep in October 2006, SW1 No. 31 switches the Sappi Mill in Cloquet, Minn. Pre-EMD "Electro-Motive Corp." builders plate (below) carries the Dec. 19, 1940 birth date of SW1 No. 32.

Steve Glischinski

from the fleets of the big roads, dozens , if not hundreds, of SW1s have found homes at industrial operations, grain elevators and short lines. A drive through the agricultural Midwest today will reveal them in bountiful supply at country grain elevators, switching carloads of grain and corn and putting together unit trains.

Although the SW1 is far from rare, one would be hard pressed to find a better-kept fleet than those found on Dunlap Island. Like the 2-8-0s and 0-6-0 before them, Cloquet's SW1s have earned their keep serving the former Northwest Paper Co. mill that has been the line's lifeblood for most of its existence. Originally a logging railroad stretching from Cloquet to the Canadian border, D&NE contracted in 1941 to an 11.4-mile short line between its Dunlap Island headquarters and an interchange with the Duluth, Missabe & Iron Range Railway at Saginaw, Minn. The "main line" fell into disuse after DM&IR lost interest in carload traffic in the 1980s, and the trackage was torn up in 1992, reducing D&NE to just four miles of track in Cloquet.

Potlatch purchased the Northwest mill in 1964, and D&NE hummed along until 2002, when it and the mill were sold to Sappi Paper. For legal reasons Sappi, which had never owned a railroad before, renamed the line the Cloquet Terminal Railroad, and dressed its diesels in an attractive red scheme.

The oldest of Cloquet's diesels, CTR 32 was turned out of La Grange on December 19, 1940, as EJ&E 234. Recently retired, it is still stored in the CTR shop. Sisters 31 and 33, built in November and October 1941 as EJ&E 245 and 241, are in daily service.

"When the Duluth & Northeastern bought them they were hoping to get 10 more years out of them," said CTR General Manager Bob Purcell of the SW1s. "We're still running them and they're doing just fine." A few years ago the engines were equipped for remote control operation, but CTR has never used it. All maintenance and inspections take place in the shop on Dunlap Island. "Our crews inspect the engines on a daily basis," Purcell says. Getting parts for the SW1s has been no problem despite their advanced age, and the railroad has no plans to retire the elderly EMDs any time soon. The pristine SW1s owe their longevity in no small part to the CTR mechanics who know them so well, and because they spend their off-duty time in the heated enginehouse, safe from Minnesota's harsh weather.

In 1967 D&NE was prosperous enough to buy a new locomotive, SW1000 No. 35, which replaced NW2 No. 34. Cloquet Terminal 35 often gets the call to work the day shift because of its extra power. However, Purcell says the SW1s deliver better fuel economy, and are preferred to switch the mill. The SW1s also work the interchange with BNSF, where they salute the newest ES44s sailing by en route to the Missabe Range for loads of taconite pellets.

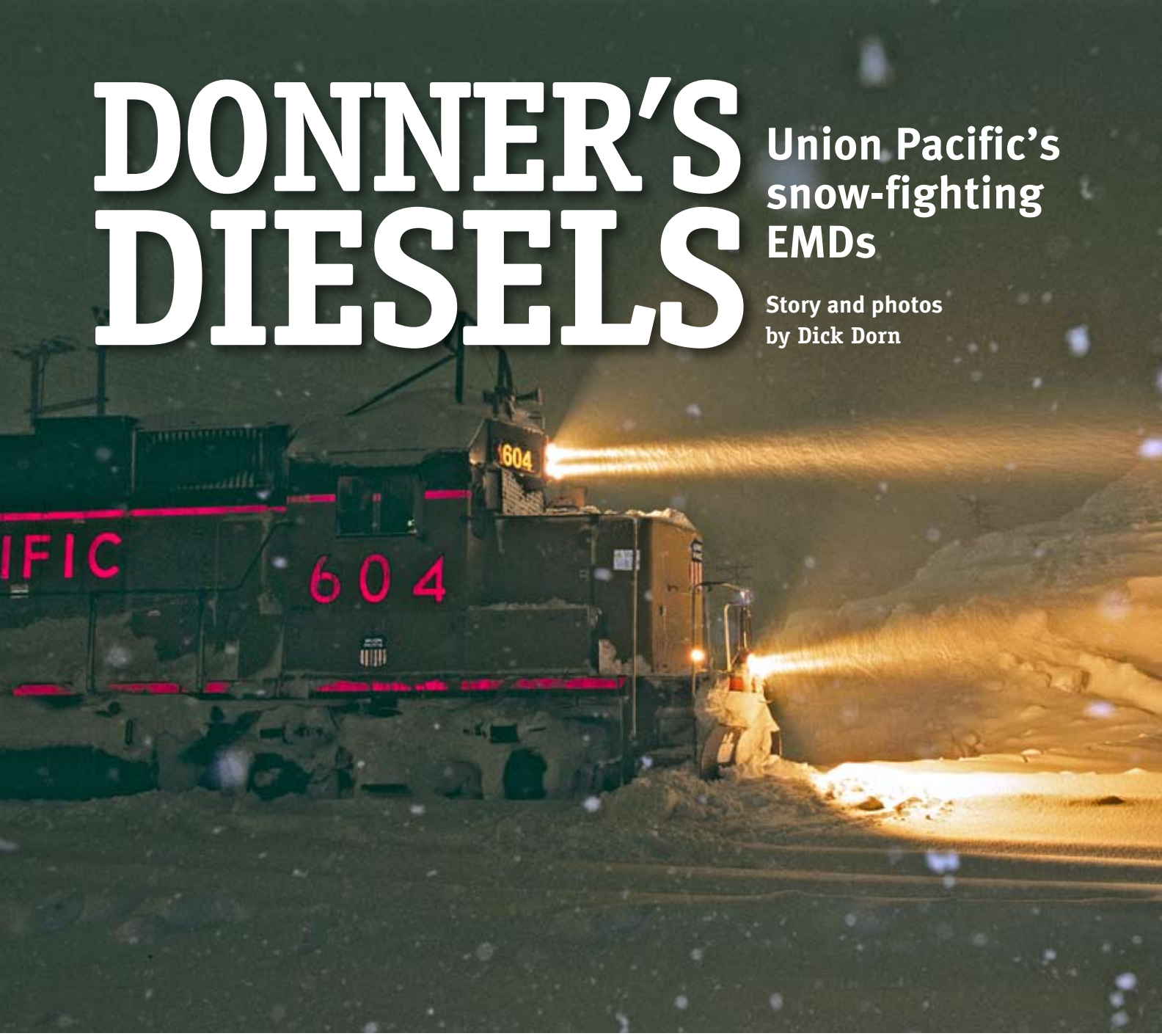
In a throwback to the early 1960s, Purcell says the railfans again visit the railroad. While the Sappi Mill is strictly off limits, the west end of the yard and the BNSF interchange are viewed easily from public streets. The tiny engines can be found switching carloads of pulpwood, wood chips and chemicals, and pulling interchange traffic to and from the BNSF connection.

With their gracefully arched cab windows, single-bulb headlights and tapered exhaust stacks, Cloquet Terminal's SW1s have the look of something old, yet surprisingly modern. It's a testament to the engineering genius of EMD that these simple locomotives of the mid-20th Century are still working in the first decade of the 21st. ▮

DONNER'S DIESELS

Union Pacific's snow-fighting EMDs

Story and photos by Dick Dorn



Assigned to flanger duty on Feb. 15, 2009, UP 604 pauses at Truckee, Calif., before heading back out on the mountain for a flip to Fulda.

Union Pacific's California crossing of the Sierra Nevada range through Donner Pass receives more snowfall than any other railroad mountain crossing in North America. Generations of railroaders have met the challenges of Donner winters with legendary innovation and effort, from the miles of snowsheds constructed by the builders of the first transcontinental railroad, to the fleets of Southern Pacific rotary snowplows, flangers, specially designed snow-service spreaders, and modified locomotives.

While the rotaries slumber (they haven't been called to active duty since 1997), the front line in Union Pacific's annual battle with Donner winters is comprised of a small fleet of flangers, snow-service spreaders, and specially adapted GP38-2s, all inherited from Southern Pacific after UP's 1996 takeover.

In the early years of dieselization, SP first employed GP9s in flanger and spreader service, but quickly settled on SD9s as the standard snow-service power on Donner Pass. The SDs were well suited to the service and soon received the first of many custom modifications for their snow-fighting duties on Donner.

By the early 1960s, SP began encountering new difficulties with an old problem. The icicles that formed in tunnels and snowsheds were wreaking havoc with automobiles riding the open-air top level of its new auto racks.

The mechanical forces in the Roseville, Calif., home base for the snow-service units soon devised a

simple but effective solution: Install large icicle breaker bars atop the snow-service SD9s. About the same time, a member of the Roseville mechanical department suggested installing high-speed rotary window overlays, used on ships during inclement weather, to give the spreader crews better visibility. The application proved so successful, the window appliances were added to the rotaries and snow-service SD9s. These windshield devices rotate at high speeds and spin water, ice, or snow off the window surface. They are mounted on the outside glass of the front windows of the cab.

Resplendent in full snowfighting gear, rotary windows, windshield grates and icicle-breaker bars, UP 585 (at top) awaits a flanger crew at Truckee, Calif., on Dec. 7, 2007. Three days before Christmas 2008 (above), UP GP38-2s 600 and 583 churn through the snow on the approach to approach Norden, Calif., with a westbound flanger.

Roseville employees also devised a modification to keep air horns functional on the snow-service units. After early experiments with snow deflectors proved unsuccessful, shop crews outfitted the horns with electric heating coils, which remain in use today. However, when the snow gets particularly heavy and piles up on the nose and cab roof, the horns must be shoveled clear, heater coils or not.

In the late 1980s SP began to retire its fleet of SD9s. Searching for a suitable snow-fighting replacement, the railroad turned to the GP38-2. In the transition years, flangers operated with a snow-service SD9 paired with a GP38-2. As the Geeps became the primary snow-service units, they were equipped with all of the requisite modifications the SD9s had received.

Five miles west of Norden on Valentine's Day 2009, eastbound spreaders in the charge of UP 574 and 602 cross the Lower Cascade bridge on Track 1.

A single incident led to an additional modification. Working a flanger on the old No. 1 track between tunnels 6 and 7 just east of the summit, a pair of Geeps encountered a slide large enough to break over the nose of the lead unit and smash through the front windshield, packing the cab with snow and pinning the crew in their seats. Fortunately maintenance crews nearby were summoned to dig the crew out. This led SP to install steel grids over the front windshields for additional protection.

Today, Union Pacific maintains a fleet of 14 GP38-2s assigned to Roseville for snow service. Seven are completely outfitted with the necessary modifications to operate as lead units in snow service. The remaining seven are unmodified and considered "B units," operating as trailing units. During summer, these units are used in local service, but then gathered up and returned to Roseville each fall.

Waiting for winter

In preparation for winter, Roseville shop forces reinstall the steel windshield grid, rotary windows, and horn warmers on the "A" units. On all locomotives, workers remove the air conditioners and reseal openings, replace door and window seals as needed, install flanger-blade controls, and supply winter tools, including shovels, brooms, picks, and duct tape. Shop forces give all 14 units a thorough mechanical examination, load-testing engines, applying new brake shoes, and checking over everything from coupler knuckles to cab lights. The goal is to keep these units on the mountain and out of the shop.

Winter operations on Donner are headquartered at the Truckee snow office, flangers and snow spreaders are stationed, and snow crews report for duty. The flangers are usually called when new snowfall reaches 12 to18 inches. They work west out of Truckee, throwing snow away from the uphill side of the tracks. Typically, they plow the 38 miles to Fulda, where they turn on a balloon track and head back to Truckee. A balloon track at Truckee can turn snow equipment. When storms drop significant snowfall below Fulda, the flangers work downhill to Colfax where they turn on the wye.

Bracketed by spreaders in standard formation, GP38-2 572 and a companion put the snowsheds behind them, plowing Track 2 on March 28, 2006.

Flangers operate with a crew of three: an engineer, conductor, and brakeman. The brakeman works in the flanger, a narrow, caboose-like car slung with moveable, belly-mounted flanger blades that can be lowered between the rails to clear accumulated snow and ice that otherwise interferes with everything from locomotive traction motors to air brake hoses that can be parted, causing undesired emergency brake applications.

Each flanger is equipped with two blades, enabling snow to be thrown to either side. Riding in the lead unit with the engineer, the conductor operates a hand-held control box with buttons to raise and lower the flanger blades as necessary. Back in the flanger, the brakeman locks and unlocks the blades as they are raised and lowered. Flangers operate at 35 to 40 mph to throw snow clear of the rails. During winter storm conditions, flanger escorts are operated ahead of Amtrak's *California Zephyr*.

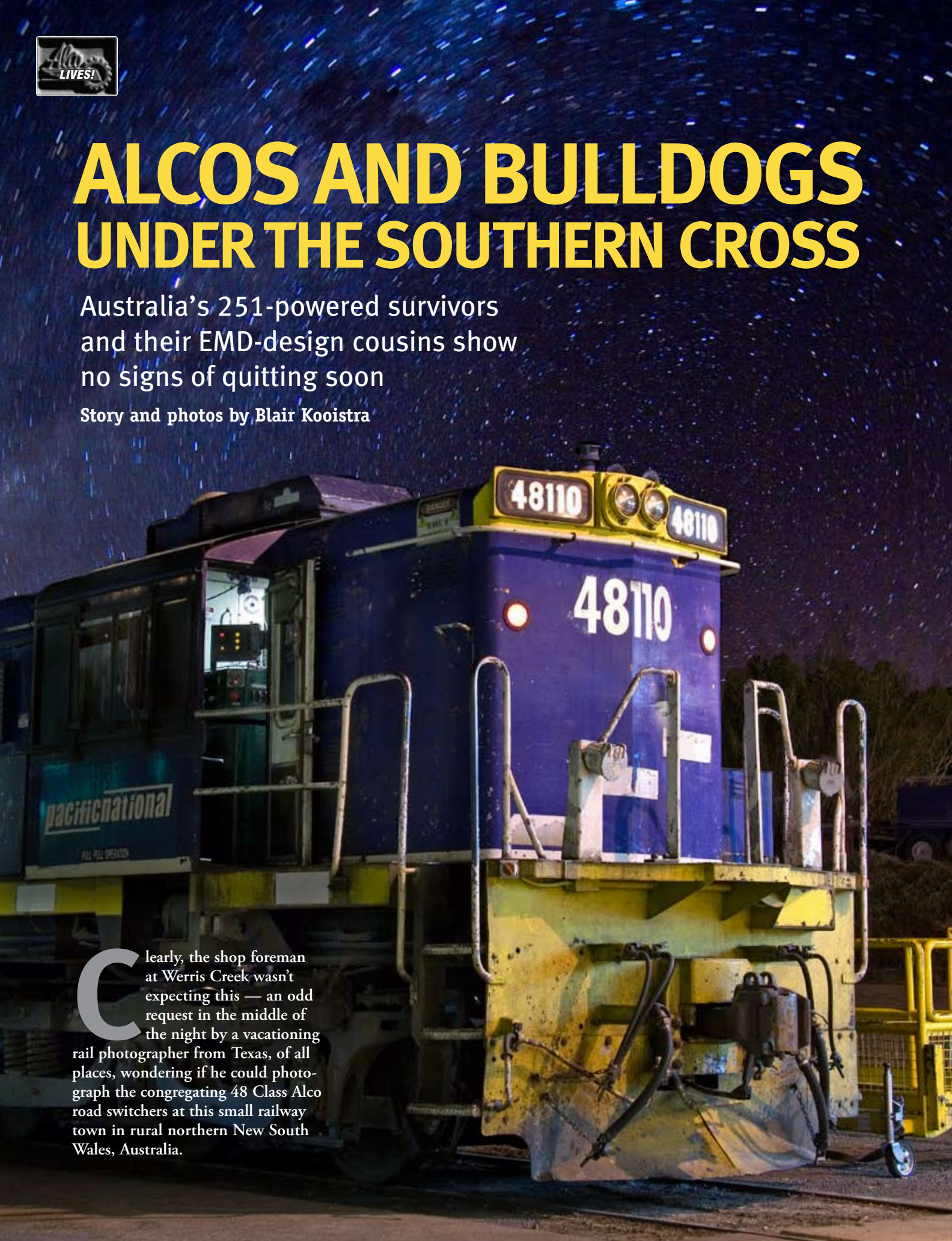
The heaviest work is handled by snow spreaders 4030 and 4034, which traditionally operate out of Truckee with a pair of snow-service GP38-2s sandwiched between them. The Truckee spreaders have differing wing designs customized for working double track. The 4034 spreader has a solid wing that can reach across the second track and is always in the lead departing Truckee. It plows snow from the uphill side over to the opposite track, then pushes it over the edge and down the mountainside. The spreaders operate at 12 to 15 mph on this initial pass. Depending on snow accumulations, they work as far west as needed, then cross over to the opposite track. The heavy plowing occurs on the return trip, as they are clearing not just the normal accumulation but all of the snow that had been plowed over to the outside track on the westbound move. The 4030 spreader, outfitted with a jointed wing that enables part of the blade to be folded clear of cuts and signal bridges, leads on the eastbound move.

The dedicated UP snow-fighting team which draws on years of experience to keep the railroad open, takes charge of this equipment. The maintenance-of-way team is lead by Mo Olvera in Truckee, who oversees the spreader operations, while Dave Bowler, Lonnie Dickson, and Tim Wellman manage flanger operations. Flanger and spreader crews are called off the Roseville extra board. This group of men works closely together to keep the trains rolling over the mountain during some of the most difficult winter operating conditions anywhere in the world. ▮

ALCOS AND BULLDOGS UNDER THE SOUTHERN CROSS

Australia's 251-powered survivors and their EMD-design cousins show no signs of quitting soon

Story and photos by Blair Kooistra



Clearly, the shop foreman at Werris Creek wasn't expecting this — an odd request in the middle of the night by a vacationing rail photographer from Texas, of all places, wondering if he could photograph the congregating 48 Class Alco road switchers at this small railway town in rural northern New South Wales, Australia.

Late on April 12, 2009, Class 48 DL531s crowd the shed tracks and shop bays at Werris Creek.

"You've come all the way from the States?" he asked, incredulously, "... just to see our 48s?"

It's a fair question. Why come 8,500 miles across an ocean, 17 hours cooped up in a jumbo jet, just to look at old locomotives? Why not spend your time touring Sydney, say, or looking up in trees for Koalas? But the foreman was sympathetic; the crazy Yank had come all this way, after all ... and he seemed harmless enough.

"Have at it, mate. But be careful."

The locomotives idling outside the shop that night were about as ordinary as one could find on the continent. A total of 218 of these DL531s were built between 1959 and 1970 by Goodwin-Alco, the largest single fleet of locomotives produced in Australia. They're as common Down Under as a GP38-2 would be in the States, and the photographer from Texas definitely wouldn't cross the street to photograph one of *those*, let alone travel halfway around the world. It is, of course, all a matter of context.

You're talking Alco, and it's been 30 years since major U.S. railroads purged them from their fleets. In 2009, few places remain where one can be surrounded by Alcos, revel in their sight, absorb the rattling sound of their six-cylinder 251C prime movers, and inhale that peculiar Alco smell of ozone, dust, and hot oil.

More than 150 units in six 251-powered model configurations, including some of the last classic Alco cab units in regular service anywhere, remain in everyday service. Eighty more are stored, providing parts while awaiting a possible call back to duty. Add in a couple dozen that heritage groups preserve in working condition for mainline excursions as well as short-hire leases to freight operators, and Australia is damned-near heaven. And don't forget about the 50 or so active EMD "bulldog" nosed freight units running around, curios like the double-ended A and B Class and the magnificent CLs of the early '70s, essentially an F45 with an F9 nose.

Such exotics remain because while new state-of-the-art EMDs and GEs work Hunter Valley coal trains, it's been a tough economic go for most freight operators since the nation went to open access for its railways in 1997. For years, much non-bulk freight traffic moved to trucks, and given Australia's vast size and relatively small population (less than 10 percent of the United States, and largely concentrated in its five largest coastal cities), turning a profit on the remaining freight has been difficult. Many operators survived only briefly before either going out of business or merging with competitors, battling it out for the scraps of traffic that freight giant Pacific National left. Rarely adequately capitalized, the smaller "hook and haul" operators can't afford new equipment, instead purchasing well-used castoffs from the old state railway system or leasing from firms like Chicago Freight Car Leasing of Australia. This hand-to-mouth existence has kept Australia's motive power in a state of flux, with trains pulled by a rainbow-painted procession of locomotives shuffled between operators and now freely migrating from state to state. In the stodgy old days of state-owned railways, such a free-for-all would never have been permitted.

A trio of preserved NSWGR diesels, DL500B "World Locomotive" 4490, GM 49 Class 4916, and Goninan-GE 4306, blast away from Orange, NSW, with the "Ocean to Outback" tour train on April 13 2009.

What heritage is all about

On a rainy April morning in the small town of Orange, 190 rail miles west of Sydney, one could come close to experiencing what it must've been like when the states ran the railway. Three vintage New South Wales Government Railways locomotives blast out of town with a 14-car "Ocean to Outback" train that the Rail Transportation Museum of Thirlmere owns and operates. The final leg of a leisurely four-day circle trip from Sydney to the mining town of Cobar will be spent retracing the route of the old Central Highlands Express and Indian Pacific across the Blue Mountains into Sydney. Clad in immaculate

Reproduction builders plate, DL500B 4490.

Indian Red paint with yellow and red trim, DL500B 4490 accelerates by the Orange North Fork signal box, bathing photographers in a warm wash of exhaust. The sound is incredible.

And what an experience! Up front, the classic set of museum-owned Alco cab units is spliced by Clyde-EMD 4916, a 1964-built branchline unit wearing the garish 1980s "Candy" paint scheme. One of 100 iconic 2,000-hp World Locomotive design DL500Bs that Goodwin-Alco constructed for the New South Wales between 1957 and 1968 leads. And trailing, a true exotic: No. 4306, the only survivor of six General Electric-Alco cabs that A. Goninan constructed in 1956-57, and notable for its late application of the 244 prime mover and a streamlined nose copied from the 1954 GE A-B-B-A 750 test set in the United States.

Design flaws left the 43 Class mechanical pariahs, and by 1976 most were out of service. Far more successful were the 44 Class, which began 20 years of Goodwin-Alco domination of New South Wales's diesel roster, dented only by token orders of Clyde-GM products:

- 40 DL541-model, 45 Class hood units, delivered in 1962-63
- 40 DL500G double-ended boxcab "Jumbos," members of the 442 Class delivered in 1971
- 50 80-class CE615s, essentially an air-conditioned 442, built from 1978-'83 by the partnership of Commonweath Engineering and MLW (Goodwin and Alco had gone out of business).

At its peak, the Alco fleet in New South Wales reached just shy of 400 locomotives. South Australian Railways, also a die-hard Alco customer, acquired a fleet of 50 nearly identical DL500Bs, DL541s, and DL500Gs. Comeng-MLW built a small fleet of 11 CE618 hood units for Western Australia's Westrail in 1977.

Even as the last Alcos were delivered, a period of railway reorganization began that eventually gutted rural passenger and freight services and closed scores of branch lines in New South Wales. New South Wales privatized its freight operations as Freight Corp., and by late 1994 had added new 81, 82 and 90 Class EMDs under a "power by the hour" contracted maintenance agreement. In a huge

The "Ocean to Outback" (top) breezes through an S-curve on the upgrade climb through Brewongle, NSW. Trailing unit, NSWGR 4306 (bottom photos) is the last survivor of six 1,750-hp, 244-engined cab units built by Goninan-GE in 1956-57.

sell-off, the railroad purged its roster of the oldest members of the 48 Class, as well as all 44, 45, and 442 Class Alcos, along with the EMD 421 Class bulldogs, 49 Class EMD branchline units, and the 20 oddball Caterpillar-powered 47 Class Hitachi-Goninan locomotives. These cast-offs became the basis for the start-up fleets of the early open-access era. Pacific National became the country's dominant freight operator when it merged National Rail (a quasi-private freight operator of standard-gauge lines across Western and Southern Australia and Victoria) and Freight Corp. in 2002. Across Australia's standard-gauge network, at least, state operation of freight railways had come to an end.

EMD-design locomotives from worlds apart meet at Port Botany on April 21, 2009. Southern Shorthaul Railroad GM class locomotives GM22 and GM27 were built in the mid-1960s for service on the Commonwealth Railway in western deserts of Australia. Swedish-built NoHAB MZ Mk. III Class 1433 is an EMD V20 645-powered locomotive built for Danish State Railways and purchased in 2006 by Independent Railway of Australia.

Sydney: Boxcabs and bulldogs and Danish helgas, oh my!

While the big boys like PN and QR National concern themselves with long-haul freight, smaller operators in New South Wales often scramble for the short-haul contracts.

Nearly all freight, from cotton bales to miscellaneous merchandise to flour and grain, moves in containers. Schedules to rural intermodal ramps from Sydney are constantly changing hands between operators, making it sport among the rail fraternity to keep track of who is operating what each week. As for motive power? The confusion of the old Abbott & Costello "Who's on first?" routine seems appropriate, as so much short-term leasing and swapping of power occurs that it's often impossible to tell which company is operating the train.

No place can match the Sydney metro area for motive power variety. Infrastructure work trains are often powered by Chicago Freight Car Leasing's fleet of Clyde-EMD bulldogs, including its trio of brightly-painted double-ended B Class units, the original EMD 6-motor locomotives, revived for standard gauge use in New South Wales after a long career on the broad gauge in Victoria. Sandwiched between the morning and evening commuter

On Easter Sunday, CFCLA-owned double-ended B class Clyde-EMDs, B76, B61 and B65, power an empty concrete tie train at Heathcoate, in south suburban Sydney. Working for Rail Corp., these 1951-52 vintage units are among the earliest of all EMD six-motor locomotives, predating even the original SD7 demonstrator.

Leased from Hunter Valley Railway Trust, DL500B 4461 (top) passes Mascot on the rear of Independent Railway of Australia train T250 on April 20, 2009. Running "No. 2 end first" (center), P&O Transport Australia-owned DL500B 4477 leads a 49 Class locomotive on Botany-bound train T280 on the freight-only Sydney Metropolitan Goods line on April 21, 2009. Two days later, leased CFCLA 442-class 44204 (lower) and Southern Shorthaul Railroad GM22, cross a canal just north of Masco Siding with Sandown-Botany trip train T182.

rush hours, short "trip trains" scurry toward Port Botany from the suburbs.

Morning trains from Yennora, Sandown, Minto, and Leightonfield follow one another to the port, competing for space with trains being made up for Narrabri, Dubbo, or Newcastle. The choreography of many trains vying for little space is amazing.

You can see anything and everything at the port, from Southern Shorthaul's snappy yellow-and-black GM Class bulldogs to the green-and-yellow 442 and 80 Class Alcos drawn from Coote Industrial's large fleet. The last two 44 Class locomotives owned by a rail operator, Nos. 4471 and 4477, work in from Yennora daily for new owner P&O Transport Australia, still wearing their Chicago Freight Car Leasing blue and silver paint.

A handful of other 44 Class units leased from heritage operator Hunter Valley Rail Trust toil on for Independent Rail of Australia. Independent Rail was legendary for its leased fleet of rust- and grafitti-covered 44 and 47 Class locomotives, earning the company the unflattering nickname "Dodgy Brothers." In 2005, the quest for cheap, reliable motive power sent Independent Rail to the ends of the earth, importing 16 surplus Swedish-built NoHAB MZ III Class from the Danish State Railways. The "Helgas," as the MZs are called, are powered by 3,600-hp EMD V20 645s: SD45s in European dress.

Call it the realm of infinite possibilities. A Helga from the misty fjords of Denmark bides time at the Port next to a Southern Shorthaul GM, itself an import from the barren Nullabor desert of Western Australia. If only locomotives could talk.

Pacific National 48 Class Alcos led by 48110 throttle up leaving Narrabri, NSW, with a shuttle grain train bound for Werris Creek on April 17, 2009.

The Backbone of the Railways

Making up nearly 80 percent of the active Alcos in Australia are the compact and lightweight (49-foot long, 77-ton) DL531s, mostly former New South Wales 48 Class, that still call New South Wales home. Like the steam locomotives they replaced, their longevity is assured by their light weight and their full amortization. A cheaper replacement isn't likely to come along soon. The late Australian author and railroader Ron Preston dubbed them the "backbone of the railways."

Most of the 48 Class retirements have come from the original "Mk. 1" fleet, of which 22 have been withdrawn. The balance survive on the books of smaller operators, including Coote Industrial, Rail Corp. (for use on Sydney metro work trains), and leasing firm Junee Rail Works. The 18 remaining former-SAR 830 Class units are largely concentrated in South Australia working for Genesee Wyoming Australia across all three gauges.

Coals to Newcastle. Chop-nosed Pacific National PL5 leads a quartet of DL531s and a train of Pelton coal past the semaphores and signal box at East Greta Junction, NSW, on April 14, 2009.

Making a rare mainline appearance, Pacific National 80 Class Alcos 8007 and 8050 lead a 48 Class descending the Liverpool Range near Murulla, New South Wales, with Newcastle-bound domestic grain on April 15, 2009. Once front-line power, the 80s are now employed as yard shunters and in banker service (helpers) out of Werris Creek.

Pacific National owns the newest units, 113 DL531s equipped with a beefier generator and rated at 950 hp. Approximately 82 of these are active, their number fluctuating with the grain harvest. This compares favorably to Pacific National's largest locomotive classes, the 120 GEs in the NR Class and 83 EMD 81 Class, with which the 48s are often used on grain and cement trains.

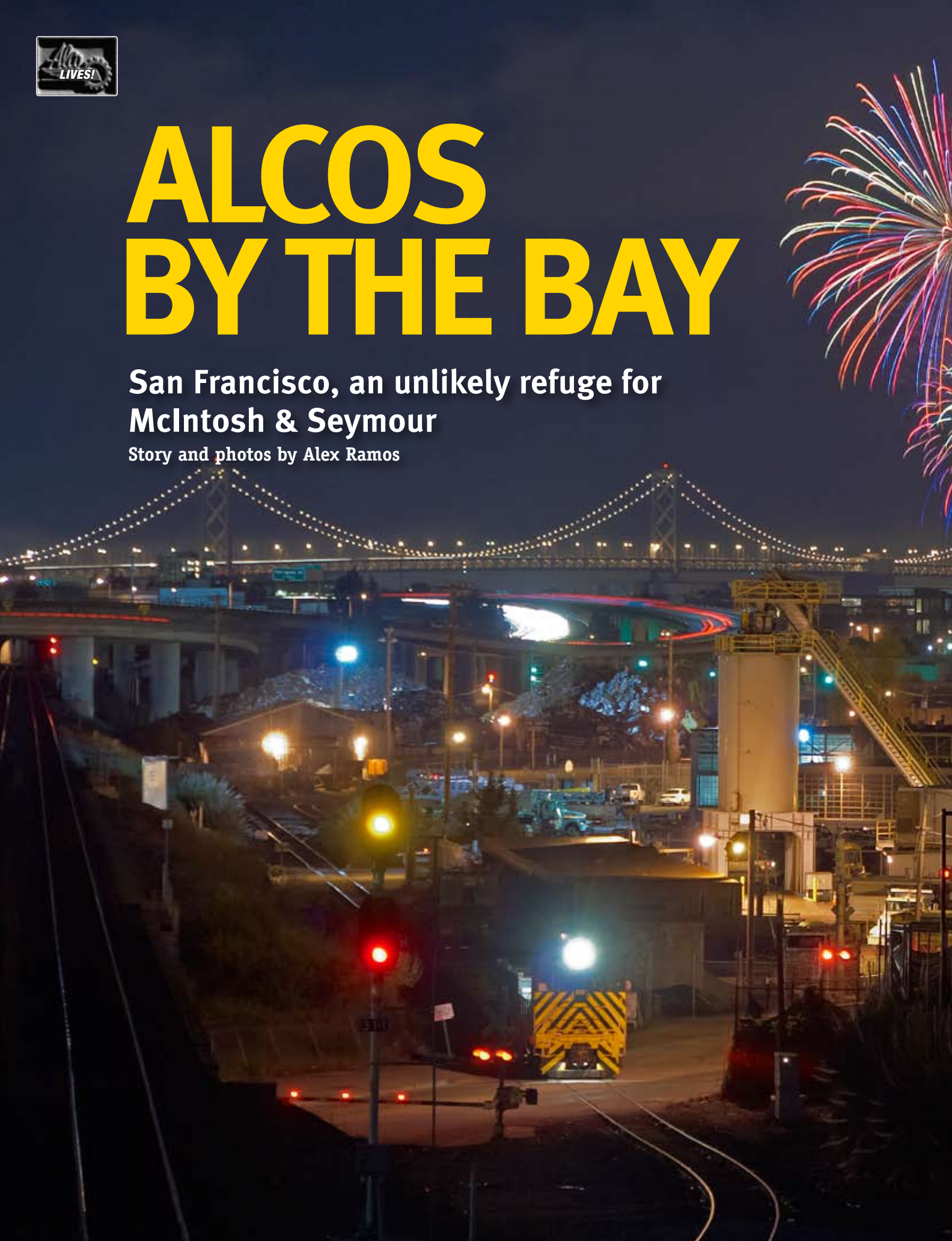
Among a dozen or so 48s assigned to Pacific National's coal division near Newcastle are several "PL" Class variants, esthetically unlucky recipients of chopped noses in the late 1990s for push-pull "Port Link" shuttle services in the Sydney area. While the conversions were successful, Pacific National has since lost the port contract, and the PLs now usually lead un-altered sisters on coal trains between Pelton mine and the Port Waratah export terminal at Newcastle, the last regular coal assignment for the 48 Class.

A portion of the route traverses the South Maitland Railway, which operated with steam power until 1984. The steep grades, light rail, and antiquated staff-and-ticket safeworking operation on the South Maitland are in marked contrast to the four-track CTC mainline from the junction at East Maitland to the port. To trainwatchers, the characteristic "whistling outhouse" sound of the 48 Class is a welcome change from the modern, exhaust-silenced locomotives that dominate this busy mainline.

The 48 Class will always be associated with the wheat country in the north and west of the state. Working from depots at Parkes, Cootamundra, and Werris Creek, teams of 48s are dispatched during the harvest to rural silos with names that evoke the Australian bush: Rankin Springs and Naradhan, Koorawatha and Lake Cargelligo, Tottenham and Nevertire, Walgett, Moree, and Armidale. These grain shuttles return to "sub-terminals" at Temora, Parkes, and Werris Creek, where wheat is stored for export through Kooragang Island in Newcastle and Port Kembla near Wollongong.

A dozen or so remaining Pacific National 80 Class share occasional grain service with the 48s. Several have recently been rehabilitated and are being used as shunting engines at Sydney, Newcastle, and Port Kembla terminals. Their long-time assignment, however, has been as "banker" engines shoving coal trains up the 2.5 percent grade over the Liverpool Range. Three 80 Class, rated for 750 tons apiece, usually team with a single 81 Class behind the 72 car, 5,500-ton coal trains, powered at the head end with three 3,030-hp 82 Class EMDs.

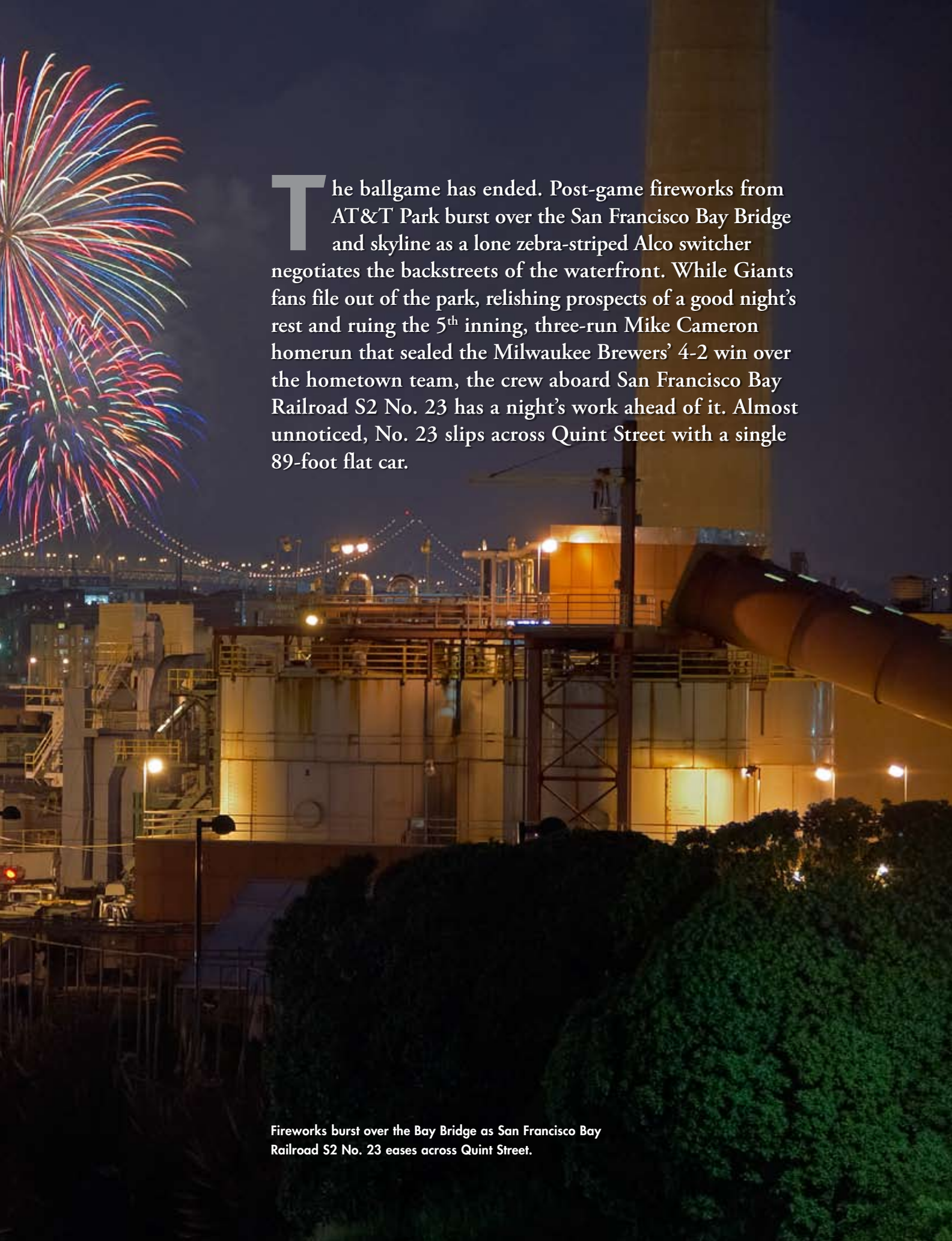
It's a testimony to the reliability of the remaining Alco fleet that such demanding service is expected of the 80 Class, which go full-throttle with remarkably clean exhausts on the shove out of Willow Tree. While their numbers have diminished, Australia's Alco-powered locomotives continue to contribute in one of the world's last grand gathering places for the 251 prime mover. And it's a spectacle that is far from over. T



ALCOS BY THE BAY

San Francisco, an unlikely refuge for McIntosh & Seymour

Story and photos by Alex Ramos



The ballgame has ended. Post-game fireworks from AT&T Park burst over the San Francisco Bay Bridge and skyline as a lone zebra-striped Alco switcher negotiates the backstreets of the waterfront. While Giants fans file out of the park, relishing prospects of a good night's rest and ruing the 5th inning, three-run Mike Cameron homerun that sealed the Milwaukee Brewers' 4-2 win over the hometown team, the crew aboard San Francisco Bay Railroad S2 No. 23 has a night's work ahead of it. Almost unnoticed, No. 23 slips across Quint Street with a single 89-foot flat car.

Fireworks burst over the Bay Bridge as San Francisco Bay Railroad S2 No. 23 eases across Quint Street.

Patrolling the backstreets of the San Francisco waterfront 30 minutes past the witching hour, No. 23 casts an eerie reflection in water pooled in potholes outside a Marin St. junkyard on April 9, 2009.

The San Francisco Bay Railroad is a 5-mile vestige of the State Belt Railroad of California, an urban switching road that once employed some 300 railroaders and plied 68 miles of trackage threading the streets and piers of the Embarcadero from south of Market Street to Fort Mason and the Presidio. The glory days of car floats, cross-bay interchange and crews working warehouses, docks and yards around the clock are history, but the railroad survives as one of the oldest — if not *the* oldest — institutions of railroading in the City by the Bay. And, an unlikely refuge for Schenectady-built locomotives powered by turbocharged McIntosh & Seymour 539 diesels.

During World War II, the State Belt replaced its steam power, primarily Alco, Baldwin and Vulcan-built 0-6-0s, with six Alco S2s numbered 20-25. Though their numbers declined as port traffic moved across the Bay to Oakland, S2s have served the road faithfully since. In 1969, the city purchased the state-owned road and stenciled a new name, "San Francisco Belt Railroad," on the Alcos' riveted black hoods. A variety of designated operators managed the city-owned line until LB Railco took over in 1994. With a long-term lease from the San Francisco Port Commission and the prospects of port expansion, the LB-operated line was renamed the San Francisco Bay Railroad in 2008.

Headquartered in a small yard at Pier 96, the railroad has a payroll of 10 employees and two locomotives. Impeccably dressed in black with yellow stripes, Alco S2s 23 and 25 are State Belt veterans that have called the San Francisco waterfront home for all of their lives. Wartime products of Schenectady, No. 23 emerged from Alco in February 1944, while sister 25 was outshopped in July 1945, just weeks shy of VJ Day.

In their State Belt heyday, the Alcos wandered along waterfront streets working warehouses and docks, and interchanging cars with Southern Pacific, Northwestern Pacific, Western Pacific, and Santa Fe. The Belt maintained interchange connections with SP at Mission Bay and China Basin, while cars from the WP and NWP crossed the Bay on ferries from Oakland and Tiburon, and made land at Pier 43. Santa Fe had its own car ferry slip near Pier 50 along the southern waterfront.

Today, the railroad's primary traffic is contaminated soil excavated from construction sites around the city. The city trucks "dirty dirt," much of it rubble from the 1906 earthquake that was used for landfill, to the railroad's yard where crews load it into gondolas and containers for shipment to disposal sites in Utah, Oregon, Idaho, and New Mexico. This traffic generates 3,000 to 4,500 carloads

Traffic lights and railroad fusees cast a red glow on the riveted flanks of No. 23 as the veteran Alco cruises the streets of San Francisco at midnight.

per year and keeps 12,000 to 18,000 trucks off the road. Union Pacific's "South City Switcher" interchanges with the San Francisco Bay daily.

The short line and the Port of San Francisco have bigger plans. California's shortest short line got a little bit longer with the recent rebuilding of the bascule bridge over Islais Creek. The work re-establishes a rail connection with Pier 80, one of the port's last cargo piers, and the railroad has its sights set on new traffic, from windmills, solar panels, steel, aggregates, automobiles, and recyclable waste products. Clearance restrictions, specifically Tunnel 4 on Caltrain's Peninsula Line, will need to be addressed before the railroad can handle hi-cubes, auto racks, and stacked intermodal containers.

In the meantime, the San Francisco Bay Railroad's old black Alcos are going green. In early 2008, the California Air Resources Board conducted extensive tests with SFBR No. 25 and various alternate-fuel blends. The result is a 50/50 bio-diesel/regular diesel blend that has cut emissions 53 percent and decreased fuel consumption 33 percent. The turbocharged 1,000-hp 539 engines in the 65-plus-year-old S2s run just fine on the concoction. So well, in fact, that the railroad has no intention of retiring the locomotives any time soon. ▮

The crew from SFBR No. 23 looks on as firefighters and police arrive to extinguish a burning Mercedes Benz.

ER FOR EMDS

Portland & Western's Albany, Ore., shop

Story and photos by Scott Lothes

"We've developed an exceptional relationship here between the mechanical department and the operating department. We decided to start treating the operating department as our customer, and they started to reciprocate. We help each other."

Randy James, manager of locomotives, Portland & Western Railroad

On the morning of May 8, 2009, Portland & Western's Albany, Ore., shop has all the appearance of an EMD operating room. Traction motors, wheel sets, power assemblies and tools are neatly laid out around GP40P-2 3002 and GP39-2 2307 as Konley Newman (right) and Pat Holgate maneuver a power assembly into position.

Consider this: you're manager of locomotives on the 520-mile Portland & Western Railroad, responsible for providing the motive-power to serve 135 on line customers in northwestern Oregon and move almost 90,000 cars annually. Your diesels have to haul 20-some regular trains, all of them working at least five days and nights per week, and many six or even seven. They have to negotiate narrow valleys, climb steep mountains, and keep up with traffic on Class I main lines.

The newest of your 40 EMD locomotives are well into their fourth decade, and some are into their sixth. With 32 units required for a typical day, 80 percent of the fleet (with an average age of 42 years) must be available at all times. Making that happen are the 13 men of the railroad's mechanical department.

Their domain is a two-track shop in Albany, built new in 1994 by the Willamette & Pacific Railroad, the year after it took over several Southern Pacific branch lines in the area. The shop is now operated jointly with the Portland & Western. The building can house four locomotives and is fully-certified by the Federal Railroad Administration as an inspection facility. The P&W's mechanical forces can perform all light and moderate repairs, from turning wheels on a massive steam-era lathe, to replacing everything from light bulbs to power

>> See a full Portland & Western roster at www.TrainsMag.com

The best-looking locomotive in the P&W fleet is inarguably SD9 1854, freshly painted in the corporate orange of parent company Genesee & Wyoming. On June 12, 2009, the 1955-vintage EMD, built as Chicago & Illinois Midland 52, glistens in the shop. At right, Randy James, manager of locomotives, and Mark Shove (in background) inspect air brake equipment of GP40P-2 3001. Shove came from SP and mentored many new employees before retiring in March 2009. Whenever special tools or fixtures are required, the shop often fabricates them. Josh Smith (middle photo) grinds the edges of plate steel. Shane Oglesbee (lower photo) works to replace the main generator bearing of GP39-2 2307.

assemblies, traction motors, turbochargers, and main generators, and the shop is looking for ways to do even heavier work.

Locomotive maintenance on the Portland & Western, as with most Class II and III railroads, is a delicate balance of prevention and response, and many problems are best handled as they arise. If there are weak points in any of the locomotives — and weak points are inevitable for hard-working, 40-year-old locomotives — the heavy demands of the P&W's route will find them. And when they do, it's up to the diesel doctors at Albany to get the locomotives back up and running as quickly and efficiently as possible. In many ways, the Albany shop is an ER for EMDs.

Just after 10 a.m., Pat Holgate (center and above), Josh Smith (left) and Richard Brown (right) remove the worn No. 2 wheelset from GP40-2 3004.

Keeping up with wheel wear

It's an unending chore on a railroad that twists through the hills of western Oregon. Wheel wear and high flanges can sometimes be remedied using a special brakeshoe with a cutting head insert, but inevitably, shop workers must remove the entire axle and traction motor assembly, and re-profile the wheels by turning them down on the wheel lathe, a process that takes two men the better part of a day.

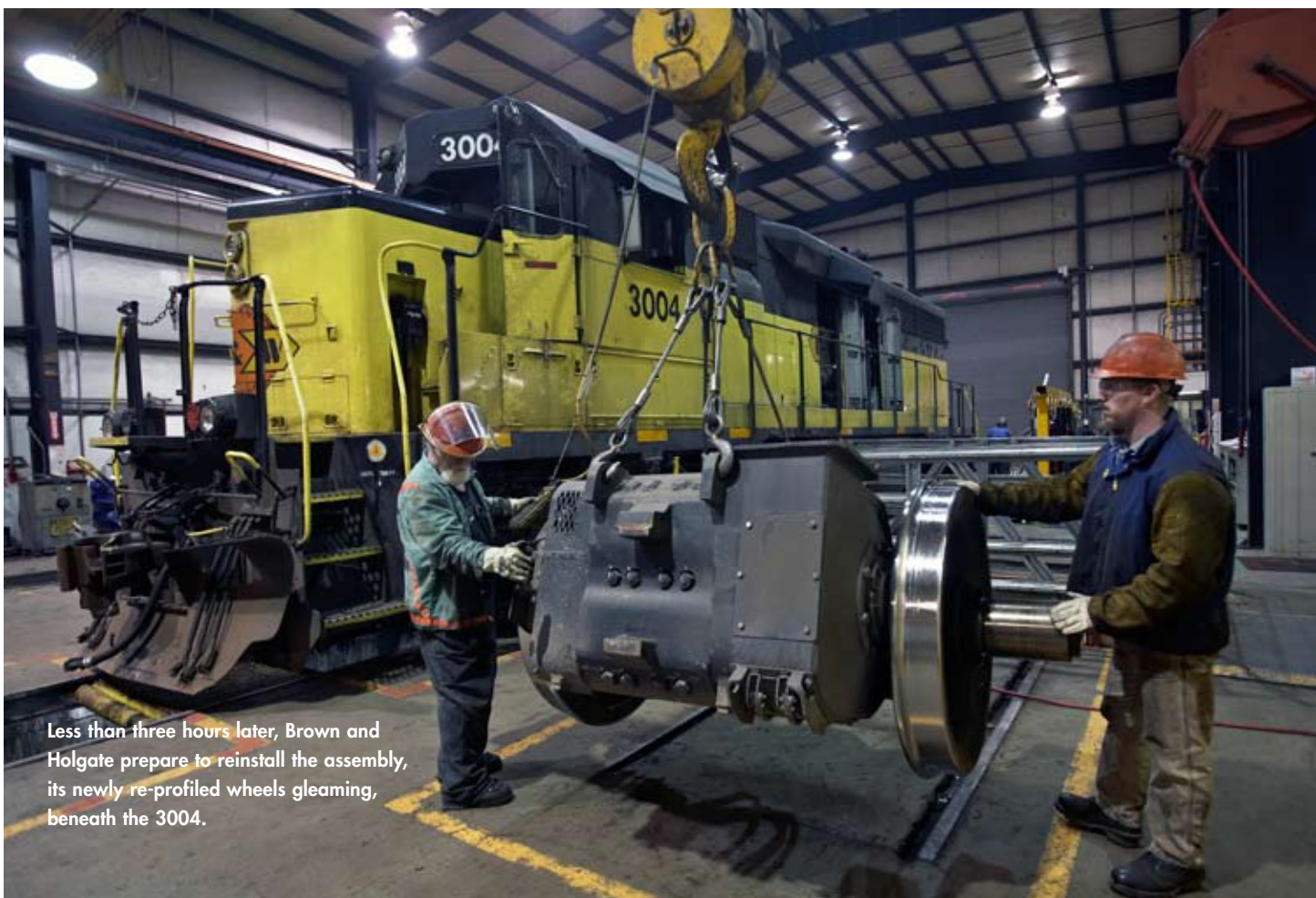
To "drop an axle," the shop employs a water-powered, hydraulic lift that came from a steam roundhouse in Portland and underscores the railroad's resourcefulness. The lift may be old, but it came at a good price and gets the job done, lowering the 6,800-pound assembly out of the locomotive and raising it back to floor level in less than five minutes.

Working on the lathe, a steam-era machine, from the Union Pacific shop in Ogden, Utah, Richard Brown and Pat Holgate turn the wheels on the axle assembly from GP40-2 3004. The work is tedious as the lathe spins with hypnotic rhythm, and a moment's carelessness can bring severe consequences. The long shavings that

Re-profiling No. 3004's wheels, Richard Brown works on the steam-era lathe.

peel from the cutting head are hot enough to burn through heavy work shirts, as well as the flesh beneath them. Safety is fundamental to the railroad's culture, and the mechanical department is justifiably proud of its record of more than five consecutive years without a lost-time accident.

By early afternoon, both wheels are gleaming with newly-turned profiles. As Holgate and colleague Josh Smith reinstall the assembly on the 3004, Brown pauses once more to admire their work, the pride of a craftsman shining in his eyes.



Less than three hours later, Brown and Holgate prepare to reinstall the assembly, its newly re-profiled wheels gleaming, beneath the 3004.

Around the clock

Every night, including weekends, Portand & Western shop managers and workers sleep beside phones that can and do ring at all hours. They field calls like 911 dispatchers and respond like EMTs, to everything from derailments to fried traction motors to burnt-out headlights.

The shop's strong relationship with the operating department is crucial when problems arise on the road. Randy James recalls a recent over-the-phone fix with engineer Mike Neale on the Hillsboro Switcher. Balancing his phone on one ear to get instructions from James, Neil adjusted a faulty brake valve with his Swiss Army knife, saving the shop crew a four-hour, 130-mile roundtrip drive from Albany ... and saving the Hillsborough a four-hour delay.

Dan Bazzy, assisted by Ronny Mayfield in the background, eases a replacement power assembly into the 16-645E engine of GP40P-2 3002.

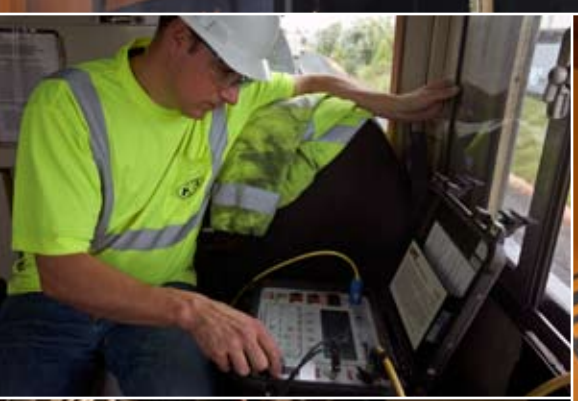
Despite the high level of support from the operating department, field repairs are an unavoidable necessity,

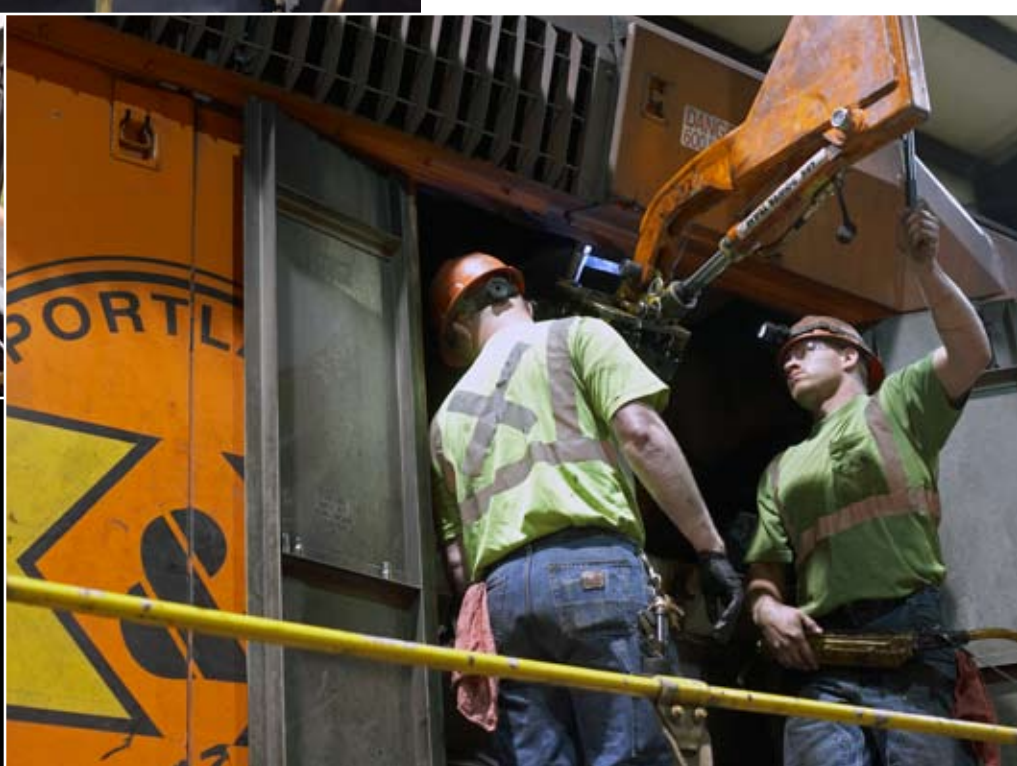
and mechanical supervisor Shane Oglesbee is typically the first responder. Working primarily out of his company truck, Oglesbee services locomotives across the northern end of the system that don't visit Albany on a regular basis, but he also comes back to the shop to help with big jobs.

Like most of his co-workers, Oglesbee is younger than many of the locomotives he repairs and services. Shop Foreman Alvin Robinson is younger than everything in the fleet, and more than half of the current workforce came to the shop without prior railroad experience. They've learned quickly, ensuring that the commerce of northwestern Oregon will continue to move, even when its motive power has to visit the emergency room. ▮

Shane Oglesbee (at top) assists with draft gear repairs to SD40-3 3051, while Doug Tennant, borrowed from the car department for his welding skills (below right) works underneath, welding the pilot. At left, Mark Shove checks out GP40P-2 3001, while his co-workers tend to GP39-2 2317 and SD9 1852. Still lettered for Willamette & Pacific, No. 1852 remains in the colors of its previous owner, Southern Pacific.

Clockwise, from above right: Brad Landers, CMO/VP mechanical, who runs the shop with a hands-on approach and deep mechanical knowledge, tests the cab signals of "SD40-3" 3051. At lower right, Pat Holgate (on left) and Konley Newman install a new power assembly in GP39-2 2307. On lower left, electrician John Nibler reconnects No. 2307's main generator following a bearing replacement, while shop foreman Alvin Robinson (above) tests cab signals of No. 3051. Contractor Johnny Davis (upper left) works on upgrading the airbrakes of SD9 1852. Blue flags affixed to P&W 3001 (opposite), an upgraded GP40 that emerged from EMD in summer 1967 as high-nosed N&W 1377, protect the Albany shopmen at work on the unit on March 10, 2009.



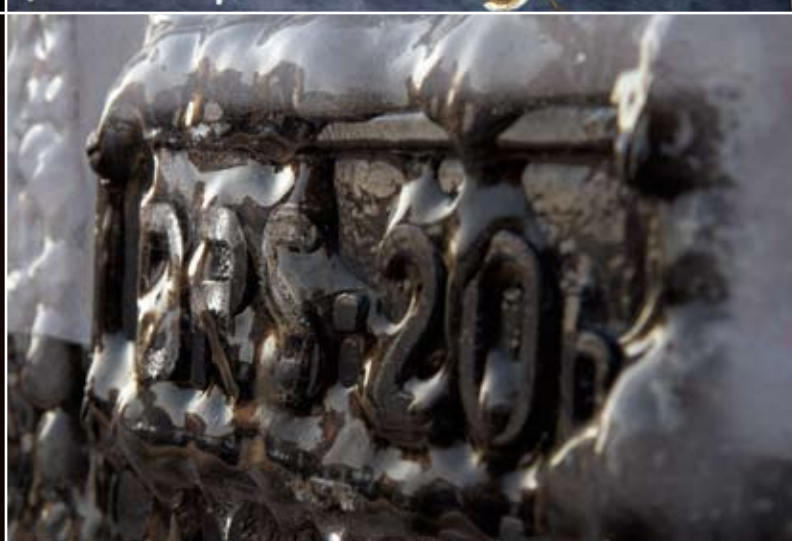


Winter Woe, Winter Wonder

by A. Ross Harrison

"Summer-Winter-Switch, Winter Operation Oct 15 to Apr 15." Six months of winter? If only it were as simple as the instructions accompanying a simple toggle switch on the electrical panel of Canadian Pacific SD40-2 5656. But when it's 40-below with the wind chill and nothing seems to work, breaking the seal and flicking that toggle switch to "summer" is akin to Dorothy clicking her ruby red heels three times to get back to Kansas. For those who know, winter is both wonder and woe. I

At top: Ice-encased bell, SOO GP38-2.
Right: Summer-Winter switch, CP SD40-2 5656.
Lower right: DRS-20b class plate, CP GP38AC 3014.
Below: Icy number boards CP AC4400CW 9660.



SterlingRailroadAuctions.com
A division of Sterling Auction Services, LLC.
License #: 16399
23823 Hot Springs, San Antonio, TX 78258
PH: (210) 545-3600 FAX: (210) 545-3610 Email: *rwmertz@sterlingrail.com*

Dear Railroad Industry Professional:

Sterling Auction Services is fast becoming the premiere marketer of Locomotives in the United States. We are constantly looking to auction or broker used Locomotives in any condition. Our purchaser clients range from National and International Railroads and other end users who need good, running Locomotives for daily use to Railroad Repair and/or Recycling Shops who need large quantities of Locomotives and Railcars for recycling and scrap.

In order to meet the ongoing needs of Sterling's vast array of U.S. and International clients and their unique needs, Sterling Auction Services is launching a revolutionary new marketplace for the purchase and sale of a wide range of Railroad Assets… ***SterlingRailroadAuctions.com***. This dynamic website launches in the 4th Quarter of 2009 and will feature the most diverse and complete marketplace for Railroad Assets of every description.

If your Railroad or firm is looking to purchase or has Locomotives, Railcars, Locomotive and/or Railcar parts and components, Communications and Signaling Equipment, Vehicles and Track Equipment, or any other Railroad Assets for sale, please call Sterling Auction Services today. If you do not have a current need, please take a moment to add us to your database, Rolodex and email list right now so that when you need swift action on either the buy or sell side, you will make Sterling Auction Services your first call.

Thank you.

Robert W. Mertz
President

Progress Rail Locomotives
Gensets & RePowers

PR22B / PR15B Genset Locomotives

Switcher or Road Switcher Service, Low Emissions, Fuel Savings, Highly Reliable, Powered with Caterpillar® C18 Engines

PR30C Regional Locomotives

SD40-2 Repower with a Single Caterpillar® 3516 Engine, EPA Tier 2 Emissions, with Available Exhaust Aftertreatment, Reduced Fuel Consumption with Improved Performance

PROGRESS RAIL SERVICES
A Caterpillar Company

Please visit **www.progressrail.com** or contact a sales representative today at **1-800-476-8769** for more information on these or other locomotive offerings including:

Used Locomotives: Sale or Lease
Wreck Repair & Modernizations
Locomotive Overhauls & Repair
Diesel Engine Repair & Overhaul