

Making Progress:

the MPXpress

Chicago's Metra was the first to employ the MPXpress locomotives. Engine #405 leads a train into Downers Grove, Ill.

By Rich Sampson

Since 1989, no fewer than 11 new commuter rail systems have been launched around the United States and Canada, bringing service to 160 stations over nearly 1,000 miles of track. This rapid proliferation of commuter rail in North America would not have been possible without several crucial components, including the engines and railcars needed to move hundreds of thousands of riders each day.

As commuter rail began to thrive, the agencies and authorities who administer and operate these commuter systems encountered a fundamental problem – few, if any locomotive manufacturers were building new passenger rail engines to haul their increasingly full coaches. Fewer still were

constructing the especially sought-after diesel-electric variety that makes extensive – and expensive overhead power infrastructure unnecessary.

This demand among the commuter rail community found its way to business leaders at MotivePower, Inc., a subsidiary of the large heavy materials manufacturer WABTEC. As MotivePower and its counterparts throughout WABTEC are well-known suppliers of numerous railcar and locomotive components in the passenger rail industry – such as electrical systems for subway cars and locomotive parts – company strategists and designers realized that a potentially untapped market might exist to supply new diesel electric locomotives for commuter and

regional rail systems in the United States and Canada. This realization provided the impetus for what would ultimately become the MPXpress Commuter Locomotive.

A New Era for Commuter Locomotives

The company that today is called MotivePower began first with the purchase of a locomotive manufacturing facility in Boise, Idaho in 1972 by then-industry leader Morrison-Knudsen (MK). There, MK created its railroad locomotive manufacturing division known as the Rail Systems Group, which would focus the work of building diesel-electric locomotives at that facility until

1994. That year, Morrison-Knudsen established the department as its own subsidiary, branded MK Rail. Acting with greater independence, MK Rail acquired many of the manufacturers who supplied them with the components necessary to build the engines, including Motor Coils Manufacturing, Power Parts Company and Touchstone.

Today's MotivePower is – as is the case with much of the passenger rail industry – the product of a series of mergers and acquisitions. By 1996, MK Rail had established an identity and product sales success to the extent that it separated from Morrison Knudsen and incorporated as MotivePower Industries Corporation. As part of the new corporation, the locomotive division became a subsidiary, now known as the Boise Locomotive Company. More acquisitions followed over the next few years before MotivePower merged with the legendary Westinghouse Air Brake Company – which had created the first modern railroad braking systems in 1869 – in 1999. As a result, the Westinghouse Air Brake Technologies Corporation, or WABTEC, was formed. Morrison-Knudsen went on to be acquired by Washington Group International, which is now part of the URS Corporation.

Meanwhile, as MotivePower gradually established its presence in the North American railroading industry, many manufacturers had gradually reduced their output of new diesel locomotives specifically geared towards passenger operations. As fewer passenger routes were in service, the market naturally responded by producing less specially-designed passenger engines. Amtrak ordered two generations of diesel-electrics, one from General Electric's Electro Motive Division – the F40 units, built between 1976 and 1990, and the newer Genesis fleets from General Electric, which began entering service in 1993. Beyond that, the commuter operators



Photo courtesy of David L. Brook

Toronto's GO Train network used a fleet of EMD F-40 locomotives in its early days (above). Amtrak's GE-made Genesis P40-series stock is the railroad's primary intercity engine (below).



Photo courtesy of Bob Mott

Los Angeles' Metrolink system operates a set of F-59PHIs built by EMD, among other motive power (below).



Photo courtesy of Andy G.

generally inherited locomotive and railcar fleets from the private railroads which now turned their focus exclusively to hauling freight, or operated large electrified networks that required a special set of engine power. A few operators ordered new F-40 or Genesis units as part of Amtrak contracts.

However, from the late 1980s through today, new communities discovered – or re-discovered – commuter rail as a practical solution to their mobility needs. In 1992, the Virginia Railway Express began service, and Los Angeles established its first Metrolink route. Since then, other new systems have come on-line in South Florida, San Diego, Dallas-Fort Worth, San Jose, Seattle, New Mexico and Nashville. All of these new operations utilized the existing tracks of freight railroads, and therefore required

The MPXpress allowed CalTrain to introduce its *Baby Bullet* express trains.

diesel-electric locomotives to haul their trains. Some of these systems turned to leasing or purchasing F-40 and Genesis locomotives from Amtrak, while others scavenged for leftovers from freight railroads or even decommissioned commuter engines last used decades before. Still, a fledgling commuter rail industry needed a new locomotive more tailored to the contemporary needs of the mode.

General Motors' Electro-Motive Division (EMD) responded with two series of locomotives suited for passenger rail service. First came the F-59PH engines, built between 1988-94, which eventually found their way into service in Toronto, Los Angeles and Dallas-Fort Worth. The design was upgraded in 1993 to create the F-59PHI, which featured a streamlined design and enhanced technologies. In addition

to Amtrak, systems in Montreal, San Diego, Seattle, Dallas-Fort Worth and Vancouver deployed the new EMD locomotive, with positive results. But, just as the F-59PHI was accruing many new sales, General Motors decided to sell its Electro-Motive Division. On April 4, 2005, EMD was sold to a partnership of private equity firms. The new company, Electro-Motive Diesel, Incorporated, decided to discontinue the production of passenger locomotives, including the F-59 engines, as the number of orders could not justify the continuation of the production line. Meanwhile, General Electric has not produced a new passenger locomotive since the Genesis fleet more than a decade ago.

Positioned to Respond

North America's commuter rail systems, once again, faced the



Photo courtesy of espethoy



Photo courtesy of Ian Jancoski

The New Mexico RailRunner uses MPXpress locomotives exclusively for its commuter rail service.

challenge of finding a locomotive to meet their needs, and finding a supplier willing to build one. Fortunately, MotivePower was ready to respond. Through their existing relationships with the passenger rail industry, they understood precisely what operators were looking for in a modern passenger locomotive. The company set its team of 70 engineers and designers to work on a new engine that would serve the developments and trends of the commuter rail renaissance. They returned from their drawing boards in 2003 with the MPXpress.

While inspired by the F-59PHI – specially its sleek-nosed cab design – the MPX would set its own standards of safety, performance and reliability. Building on the manufacturer’s three-plus decades of experience designing and building diesel-electric engines, the team also added new technologies to

yield higher horsepower, better fuel efficiency and lower emissions than any previous diesel-electric passenger locomotive.

“Our design team based its work on input from on-the-ground operators of commuter rail systems,” explains Rich Stegner, Director of Business and Product Development for MotivePower. “The priority wasn’t just on producing a serviceable locomotive, it was to address all the developments that had been occurring in the field with an engine directly aimed at the commuter rail mode.”

Measuring 68-feet long and 15-feet high, the MPXpress tops out at around 295,000 pounds and its top model version is rated at up to 4,000 horsepower, which allows a single engine to haul as many as 12 coaches at speeds reaching 93 miles per hour. By comparison, the F-40 units had a top hauling power

of 3,000 horsepower. Additionally, commuter rail operators can choose between options that include either a separate diesel-electric generator to supply power to the passenger coaches or one that derives its power from the main traction engine.

Beyond the performance capabilities of the engine, the MPXpress also offers the latest advances in structural design to improve durability. The MPX’s frame can withstand 800,000 pounds of force and meets the structural safety standards established by both the Federal Railroad Administration and the American Public Transportation Association. At the same time, it is the only locomotive of its type which meets the Environmental Protection Agency’s Tier 2 emissions standards and is already positioned to meet the expected Tier 3 levels. Finally, with fuel costs rising for all transportation operators, the engine



MotivePower's Boise, Idaho plant features 13 buildings, 11 of which are shown here.

is the most fuel efficient available today by utilizing MotivePower's own microprocessor technology to control the engine's systems and maximize its performance under standard operating conditions.

"The MPX is unlike any other diesel-electric locomotive operating today," says Stegner. "Because any rail service is already an expensive proposition, having a locomotive like the MPX helps to lighten the load in terms of operating costs for rail systems."

Building in Boise

Since 1972, the locomotive works in Boise have produced more than 2,500 engines. MotivePower's 50-acre Boise facility contains 13 major buildings and more than 300,000 square feet of indoor assembly buildings. More impressively, more than 600 American workers staff the plant, building not only MPX locomotives, but low-emission and switcher engines for freight railroads. The crew in Boise prides itself on its just-in-time production method, so that finished locomotives don't languish unused, and rail operators can begin utilizing their locomotives as soon as possible.

Since the MPXpress production line was started in 2003, MotivePower has supplied every new diesel electric passenger locomotive in service in the United States and Canada. And while the new engine was primarily designed to adapt to the modern commuter rail landscape, its first order came from one of the largest and most established commuter rail systems – Chicago's Metra network. Metra purchased 27 locomotives – technically designated as the MP36PH-3 series, and began integrating them across their system in 2003. Their order was designed to allow the agency to retire some of its F-40 fleet.

(For more information on Chicago's Metra network, see RAIL #18 – ed.)

"With our first order delivering locomotives to Metra, we were able to demonstrate out of the gate that the MPXpress could perform on one of the nation's busiest and most well-established systems," said Stegner. "It really got the ball rolling for us with other operators."

Since the MPX debuted in Chicagoland, MPX locomotives have made their way to the Caltrain operation, which connects San Francisco to San Jose and Gilroy.

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- Rich Stegner, MotivePower

The MPX technology was the key factor in allowing Caltrain to initiate its higher-speed, limited-stop *Baby Bullet* express trains in 2005.

"We are very pleased with the order of locomotives that we received from MotivePower and they were instrumental in initiating our *Baby Bullet* service," said Jerry Kirzner, Deputy Chief of Operations for Caltrain.

But well-established commuter operations were not the only ones to benefit from the MPX. Vancouver's West Coast Express and New Mexico's RailRunner each purchased groups of engines from MotivePower. Likewise, locomotives are already on-hand and undergoing testing on Utah's new FrontRunner line between Salt Lake City and Ogden, and another set will arrive for the Northstar line serving Minneapolis and its northern suburbs set to open in 2009. Additionally, the MPX technology continues to evolve, as a new series – identified as MP36PH-3C – was developed at the request of GO Transit, the commuter network in and around Toronto. The 27 locomotives built under the order will allow the new MPX engines to integrate more easily with the maintenance needs of GO's varied locomotive fleet.

"We are moving ahead to create a transit culture in this province," said Harinder Takhar, Ontario Transportation Minister. "These new locomotives will help make GO



service more efficient and reliable for more than 140,000 riders who take GO trains daily.”

Toronto’s GO Train recently launched its first MPXpress locomotives, one of which is seen here assisting a GO F-40 and a trainset of GO’s distinctive BiLevel coaches.

Foothold Established

Today, the various series of MP36PH fleets number 66 currently in service, with another nine expected to serve the systems in Utah and Minnesota. GO Transit also holds an option to purchase another 26 locomotives once the current series is delivered. For MotivePower, the prominence of their locomotives across North America’s commuter rail systems demonstrates their risk in creating the new engine brand was justified.

“We took a chance on the continued growth of the commuter rail mode early this decade,” says Stegner. “I know that all our employees here feel a sense of accomplishment and validation in our work, especially when we stuck out our necks when few others were willing to do so.”^R

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