



BRIAN SOLOMON, INSET: NEW YORK AIR BRAKE

# New power plays to watch

In the world of American freight locomotives, the exotic is not so exotic anymore. It wasn't long ago that concepts like multiple-engine switchers, hybrid power, and remote tracking and health monitoring were experimental. Facing high diesel fuel prices, stringent air pollution regulations, and strained capacity where a high degree of utilization and lower operating costs are required, railroads are embracing these technologies with a speed not seen since dieselization accelerated after World War II. The market for new switchers has been blown wide open, producing a host of new designs, and opportunities for small companies whose bread and butter previously came only from rebuilding. The traditional OEMs—EMD and GE Transportation—have almost overnight been joined by companies like MotivePower, National Railway Equipment Co., RailPower Technologies, and Brookville Equipment Corp. Systems like EMD's IntelliTrain, GE's PinPoint™, and **New York Air Brake's LEADER** are providing railroads with the tools they need to operate and maintain their locomotive fleets with greater efficiency. All of this is microprocessor-driven.

Microprocessor engine control systems are the brains behind a new generation of switchers that is gradually replacing older, less efficient four-axle units in many Class I yards. The MotivePower division of Wabtec led the way several years ago with the single-engine, Caterpillar-equipped MP15D and MP20D, produced under license to EMD. Dozens of these units have been sold to Class I's and several terminal railroads. Around the same time, RailPower's RP20BH Green Goat, a hybrid switcher

Multiple-engine switchers and wireless real-time health monitoring are just two of the many technological advancements shaping the locomotive market, and changing the face of railroading.

**By William C. Vantuono, Editor**

combining a small diesel engine and generator charging a bank of lead-acid batteries driving traction motors, found a niche.

The switcher configuration taking the industry in a new direction is the genset, a locomotive equipped with two to three independent, microprocessor-controlled engine/generator sets that cycle on and off, depending upon load conditions. NREC, working with Union Pacific, broke important ground with a prototype 1,400-hp, twin-engine unit about one year ago. Now under construction for UP are 60 2,100-hp, triple-engine GS21B gensets equipped with four-cycle, six-cylinder, 700-hp Cummins QSK-19 engines (*RA*, March, p. 12). These units are expected to provide NOx and particulate matter reductions of up to 80% and fuel savings of up to 40%, compared to conventional switchers. NREC has ramped up production at its Paducah, Mt. Vernon, Dixmor, and Silvis plants to fill UP's order.

Joining UP's 60 NREC units will be 80 Railpower RP20BD 2,000-hp, triple-engine genset road switchers. Built on the same platform as the Green Goat and sharing its d.c. buss control, a prototype is currently undergoing validation testing. RailPower says its RP-Series units can provide fuel savings of up to 35% and reduce NOx and particulate emissions by approxi-

**Above:** Norfolk Southern says **New York Air Brake's LEADER (Locomotive Engineer Assist/Display and Event Recorder)**, deployed on Virginia Division unit coal trains, is providing fuel savings of up to 10% on head-end locomotives and up to 30% on head end/pusher combinations. **Phase II** of this project employs engineer coaching screens (inset).



## Going wireless

In the drive for better fuel efficiency, improved train handling skills can go a long way. NS has taken this concept quite far in its application of **New York Air Brake's LEADER** (Locomotive Engineer Assist/Display and Event Recorder) system on 15 GE Dash 9 locomotives used in unit coal train service on the Virginia Division's Winston-Salem line. **LEADER** prompts the engineer to apply throttle and brake settings that yield fuel savings as well as reduced component and track structure wear, "cutting down on in-train forces and helping prevent track/train dynamic-caused derailments," according to Dr. John Samuels, president of Revenue Variable Engineering LLC (and NS's recently retired senior vice president-Operations and Planning Support).

In Phase I of the program, he says, **LEADER** "calculated a theoretical golden run. We then did a series of actual runs to validate the data, and they were very close to our calculations." NS realized a fuel savings of as much as 10% on head-end locomotives; 25%-30% on head-end/pusher combinations. In Phase II, coaching screens have been added in the cab that provide throttle position and safe-braking prompts, plus predictions on what settings should be used 8-10 miles out. Future plans call for **LEADER** to be integrated into NS's OTC (Optimized Train Control) software suite, now in development. The technology, says Samuels, "is cost-justified because it provides a good return on investment, especially with today's higher fuel prices—high enough to clear any Class I capital hurdle." This fall, another 50 **LEADER** systems will be deployed on the Virginia Division.

Contract locomotive tracking and health monitoring are now widely used on Class I's. GE's PinPoint and EMD's IntelliTrain services have both undergone significant upgrades since their introduction several years ago.

GE's current version of PinPoint, Generation 2, is installed on 3,008 locomotives on two Class I's. Generation 3, which will be tested on both, features added capabilities for tracking and measuring dwell time on locomotives while they're in yards. Gen 3 uses WAAS (Wide Area Augmentation System) GPS, a highly accurate form of GPS that offers more complex "geo-sensing" capability. It can determine, for example, whether a locomotive is on a service track or an adjacent ready track—information important to mechanical or transportation personnel, respectively. Dwell measurement data can be used to improve throughput and utilization.

Kansas City Southern is IntelliTrain's newest customer, using the service as a maintenance tool on 33 SD70ACs and 10 SD90MACs. At the railroad's LMC (Locomotive Monitoring Center), help desk personnel can take action on three levels of email alerts on specific faults, according to General Director of Asset Management-Locomotives Tom Hadel. "A Level 1 alert means corrective action can be deferred to the next shopping," he says. "A Level 2 means the problem can be addressed in the field. A Level 3 means, 'I'm sick, get me to the shop right away.'"

Taking full advantage of these and other beneficial technologies requires that the railroads aggressively address whatever internal issues remain surrounding their use of wireless communications. ■

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