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Gary Frantz | Contributing Writer

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# Raising the Bar for Reefer Monitoring

## Fleets, Suppliers Adjust to Tighter Food Safety Demands


*A driver for Southern Refrigerated Transport checks the settings on his reefer unit. Refrigerated carriers are using telematics to monitor their freight. (Southern Refrigerated Transport)*

The real-time data and telematics revolution in trucking, coupled with federal regulations requiring more precise cold-chain monitoring and reporting on perishable foods in transit, is driving a new era of innovation and improved performance in the refrigerated trucking market.

It is an opportunity being embraced by reefer fleet operators, equipment manufacturers and technology providers. Driving this evolution are more sophisticated and capable trailer-mounted remote-monitoring devices, which transmit a host of data in near-real

time about in-transit reefer trailer operating performance and location; “cloud-based” platforms and software tools that capture, validate and combine data from many devices and give dispatchers a continuous, comprehensive view of a reefer’s operating status; and design advances and improvements in refrigeration units by manufacturers.

All of these developments have supported carrier and shipper compliance with more stringent “chain of custody” monitoring, recordkeeping and reporting mandated by the Food Safety Modernization Act, in particular the Sanitary Transportation of Human and Animal Food rule promulgated by the Food and Drug Administration.

*Samson*

“The FSMA gave the FDA the opportunity to go in and tie all the facets of the supply chain together to make sure that if there is a problem at this stage in the process, then they can go back and figure out exactly where that came from,” noted Jon Samson, executive director of the Agriculture and Food Transporters Conference of American Trucking Associations, in a report published by Spireon, a provider of remote-tracking devices and management systems.

The rule beefed up not only the requirements about records concerning food manufacturing and transportation, but also agreements between companies that articulate who has responsibility for which safety measures at what point in the chain.

Most large carriers were required to be compliant and operating under the new rule by June 2017, while reefer fleets with fewer than 500 employees and $27.5 million in annual revenue had until June 2018 to comply. Carriers with less than $500,000 in revenue are exempt.

Fortunately for large reefer fleet operators, complying with FSMA was mostly a matter of investing in education — for employees and shippers — and adjusting and updating processes and practices to ensure proper monitoring, more comprehensive record-keeping and reporting.

Major fleets for the most part already had remote-sensing devices installed in reefer trailers, while suppliers had built some level of remote performance-monitoring

telematics and exception alerts into refrigeration units. The remote-sensing units regularly record and transmit data points such as temperature and humidity, air flow in the trailer, refrigeration unit performance and other status information, such as low fuel level in the reefer's fuel tank. Those are presented to fleet operations personnel, who can access the information via desktop, tablet or smartphone, in various reporting configurations and dashboards that let them track and monitor performance — and act quickly when needed.

Southern Refrigerated Transport already had the necessary trailer-monitoring equipment and technology in place, said Billy Cartright, executive vice president and chief operating officer at the Texarkana, Ark.-based fleet.

The systems "are sophisticated enough that we can check a trailer's temperature [at any time], and adjust, troubleshoot or reset if needed," he said.

The sensors record and transmit location and operating status of the reefer at regular intervals — typically every five minutes — over the duration of a run, and while loading, unloading or staging.

A full-truckload refrigerated carrier, SRT handles 150-200 loads daily with an average haul length of 800 miles.

In response to FSMA, the fleet developed and deployed a 24/7 operations monitoring team that continually watches reefer performance in transit. The team has escalation plans and alert levels that kick in with specific actions when an anomaly occurs.

"It's like a strike team that goes into action when an incident happens," Cartright said.

The remote-sensing and reporting technology employed by SRT was developed by Orbcomm, a provider of internet of things remote sensors, monitoring and fleet management systems, and operates as a "two-way" communications platform.

If alerted by the reefer trailer's telematics to a problematic change in status or a new condition, a dispatcher can remotely initiate actions to resolve the issue — often from a smartphone or a tablet. If those remote actions are ineffective, then the driver is alerted and directed to pull over and remedy the problem, go to a repair facility or wait for a replacement reefer trailer, if necessary.

The unique aspects of refrigerated fleet management aside, reefer fleet operators still must deal with all the other normal trucking industry challenges. These include recruiting and retaining qualified drivers, operating and effectively maintaining equipment over a crumbling national road infrastructure, increased city and highway congestion and proposed state mandates to reduce or eliminate greenhouse gas emissions from reefer units.


*A Navajo Express truck travels on Interstate 15 outside Las Vegas. (John Sommers II for Transport Topics)*

Navajo Express Inc. is a Denver-based temperature-controlled truckload carrier with primarily dedicated operations.

Its 1,000-tractor and 2,500-trailer fleet was “ahead of the curve” and already equipped with remote-sensing devices and GPS-location tracking, so its biggest challenge related to FSMA compliance was driver and customer awareness, and instituting proper training, documentation and record-keeping, said Tim Staroba, Navajo’s executive vice president.

He noted that refrigerated trucking operations must keep a very watchful eye on trailer operating performance and travel time, especially with today’s congested highways and driver hours-of-service requirements.

“You have to closely monitor the reefer to make sure it stays in temperature. And you don’t want it to run out of fuel and spoil a load,” Staroba said, noting that this requires more interaction and awareness by the driver to support consistent reefer performance.

“From Navajo’s perspective, our overall belief is that you combat congestion by how we can load more onto the trucks and trailers we have, and run the most optimized routes for our drivers,” he added.

Navajo has partnered with equipment manufacturers, challenging them to build tractors and trailers that are lighter.

“They’ve done a great job for us,” Staroba said, “enabling us to take a trailer that once would have a maximum 42,000 pounds of product and increase the load to 48,000 pounds.”

With that additional capacity, measured over 10,000 loads annually, Navajo can move the same amount of freight with 1,600 fewer trips.

The carrier and the shipper both win, Staroba said. “The customer saves money by using fewer trucks, we get better utilization of equipment, we can take trucks off the road [to help reduce congestion], use less fuel and reduce emissions.”

Today, Navajo has 57-foot reefer trailers that are lighter than the traditional 53-foot trailers.

*A Thermo King refrigeration unit on display at an industry trade show. (John Sommers II for Transport Topics)*

Thermo King, a major supplier of refrigeration units for transportation equipment, worked closely with customers to understand their needs and help them prepare for FSMA, said Scott Bates, the company’s product management and marketing leader for North America.

“We incorporated that understanding into our products and was one of the factors that led us to putting our telematics [package] standard on every piece of equipment we ship,” he said.

Thermo King units can collect data from standard onboard sensors measuring various reefer unit performance metrics, such as temperature and inbound and outbound air flow for the unit, as well as sensors inside the trailer and even a product-level sensor probe that can go into a pallet.

Thermo King’s Connected Solutions platform provides various options for how a customer can interact with the refrigeration unit, view operating metrics and remotely manage performance.

“It gives the carrier a lot of operational control, in terms of risk avoidance, protecting the product and meeting the shipper’s standards,” Bates said. “If they get an alert, they can triage what action to take and prioritize it to do something immediately to protect the load.”

The company also launched TK Notify, a mobile app that provides notifications directly to a smartphone with detailed information on an “out of condition” event, and guidance on remedial action.

“We are taking the technology to where people are working today,” Bates said.

It’s especially valuable for longhaul drivers sleeping overnight.

“When they get up in the morning, they can check their smartphone and confirm the unit and cargo are performing to spec [without leaving the cab],” Bates said. “That’s important to the driver when it’s 10 below outside.”

“Carriers realize they need to have deeper insights into what is happening in real time on the assets themselves,” said Craig Marris, co-founder and executive vice president at Coretex, a provider of fleet-management telematics sensors and software.

*A Southern Refrigerated Transport tractor-trailer at a truck stop near Carnesville, Ga.(Russ MacNeil)*

The more granular reporting under FSMA has driven “far better and more meaningful information internally to the functional organization,” he said. “It’s more frequent, more comprehensive and more detailed reporting,” which ultimately leads to improved food safety and better operations management.

Carriers have to get smarter about how they operate reefer trailers to prevent rising fuel and other costs from eating into their profits, said Al Tama, senior product development director at Orbcomm.

“Smart data from IoT devices enables fleets to compare and benchmark the performance of different [reefer] units,” he said. “That helps identify the most efficient equipment, exercise better business planning and [manage] costs.”

Perhaps most important, Tama said, is how these systems enhance “the ability to verify perishable cargo condition throughout the supply chain, [which] has huge value for producers and retailers who are looking to validate food quality and safety and build consumer trust.”

What's the end game for reefer operators and the future of remote-sensing devices and reporting platforms?

"Biggest desire is to go farm to fork," Marris said. "Really understanding right down to the case level, truly following the product all the way through [each node and handoff in] the supply chain from producer to consumer. That's nirvana."

Roni Taylor, senior vice president of strategy and business development for Spireon, noted the increasing buzz in the industry regarding "smart" trailers and "connected" vehicles, as was the case at the Technology & Maintenance Council's annual meeting in Atlanta.

"At this year's TMC, whatever piece of equipment was being sold, all had a modem on it," she recalled.

Yet feedback from customers is that they don't want to have to deal with, much less buy and maintain, multiple pieces of communication equipment on the reefer trailer.

"There is an influx of data now available for trailers," she said. Much like what happened with cellphones, "eventually trailers will become smarter, but carriers can't digest that information quite yet. Customers help us determine what information we give them from the trailer," which at the end of the day will drive how remote-sensing devices and communications platforms continue to evolve and protect the safety and integrity of food in transit.

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