## Electric Standby Case Studies and Articles

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Across the board

From warehouses to refrigerated trailers, Food Supply is all about improving efficiency

Fleet Owner May 11, 2015

It started with the lighting in our warehouse,” says Steve Stidham, director of operations at South Daytona, FL–based Food Supply Inc. “We replaced high-intensity discharge bulbs with compact fluorescent lamps and cut our electric bill in half. That change paid for itself in three months.”

The experience, Stidham notes, led to several decisions related to the company’s fleet of seven tractor-trailers, which are used across Florida to deliver refrigerated and dry goods. Each day, Food Supply units make about 15 stops carrying a wide range of items from a product list that runs more than 135 pages.

“We’ve really had our eyes opened about what the newest, more efficient trailers, refrigeration units and tractors can mean for us,” Stidham says. “In this business, the fleet is a cost center so we have to show a bottom line improvement, a reduction in our cost per mile, to prove we’re saving the company money. Our latest decisions about the fleet were based on math that in many cases showed a return on investment in months rather than years.

“Reefer fuel consumption is one area we’re addressing successfully by spec’ing Carrier Transicold Vector 8600MT multi-temp refrigeration units on our latest Great Dane 36-ft. reefers,” Stidham states. “The all-electric refrigeration technology cuts fuel use because it is
powered on the road by an onboard generator that is driven by the unit’s diesel engine. At the same time, we eliminate fuel consumption altogether with electric standby when we’re loading trailers.

“With the help of PLM Trailer Leasing and Carrier Transicold dealer Sunbelt Transport Refrigeration,” he continues, “we were able to estimate costs and prove that we could quickly recoup the investment we needed to make in an electrical system upgrade at our warehouse and in electric standby on refrigeration units.

“The savings come from significantly lower fuel use,” Stidham adds. “While our 2006 reefers used 25 gal. of fuel on average per day, the new Vector units average just 13 gal. per week.”

Additionally, Stidham says that using electric standby when loading trailers at night helps improve both air and noise quality, and that the system’s self-disconnecting and automatic shutdown feature assures safety if the unit is accidentally left connected when the driver pulls away from the dock.

“We’re also leasing tractors ... Currently, we’re replacing 2011s with 2016 model year units and anticipating a large improvement in fuel economy by spec’ing Detroit DD13, 410-hp. engines and DT12 automated manual transmissions,” he relates. “We’ve also set the maximum road and cruise speed at 70 mph and the idle shutdown timer at five minutes.”

Leasing gives Food Supply a network that can handle everything from service to breakdowns, Stidham notes. “Lessors are a backstop for us and our drivers,” he says. “They provide support and have assets located throughout the state so if there’s a problem, we can quickly replace the unit and ensure orders are delivered in a timely manner.”

Food Supply strives to stay competitive by meeting all the needs of its customers and by continually bringing in more national brand items to expand its offerings. Today, the company enjoys an industry-leading order fill rate, i.e., the number of items shipped as a percentage of the number ordered, of 99.6%.
Hybrid power

Reefer fleets cut engine idling time and save big with hybrid refrigeration, shore power systems

The numbers make a compelling argument. Hybrid trailer refrigeration units can reduce operating costs by as much as 70% when compared to traditional diesel-fueled refrigeration, and the savings should grow as electric shore power becomes available at more locations where loaded trailers are parked for an extended time.

Recently, managers at Maine’s Paper & Food Service, Conklin, New York, reported that 33 trailers with Carrier Transicold’s hybrid refrigeration units have generated nearly $300,000 in annual fuel savings since being placed in service. These trailers are just 6% of the company’s 500-plus trailer fleet.

At Mile Hi Foods Company in Commerce City, Colorado, fleet managers estimated that 27 trailers with Carrier Vector refrigeration units saved the foodservice distributor approximately $85,000 in fuel expenditures during the first year the units were in operation. Witte Bros in Troy, Missouri, is another refrigerated fleet that is reaping significant savings with Carrier’s hybrid refrigeration units. Managers say fuel savings for the company’s 245-plus refrigerated trailers could be as high as $20,000 a week if they could plug into shore power systems every time a trailer is parked.

Growing popularity

David Kiefer, director of marketing and product management for Carrier Transicold, says these testimonials are hardly out of the ordinary. “It’s because the use of electric
Hybrid power...

standby significantly reduces operating costs—usually 40% to 70% compared to operating on diesel, depending on the cost of fuel and electricity,” he says. “Standby operation brings additional benefits, eliminating emissions and noise from the refrigeration unit engine, while also conserving fuel for the highway. Depending on the fleet and its distribution network, the time a trailer is parked for loading and unloading can account for a large portion of the refrigeration unit runtime, so the savings can be significant.”

Kiefer adds that Carrier has seen a steady rise in demand for the Vector units. “Initial customer demand was piqued by benefits of unit efficiencies, reduced maintenance requirements, and quieter operation offered by electric refrigeration systems,” he says. “The built-in electric standby capability has become a more important feature as fuel prices have risen and customers have recognized the savings potential. In some of the more developed countries in Europe, where hybrid systems have been available longer and fuel prices are significantly higher, more than 70% of the truck refrigeration units sold today have electric standby.”

Carrier’s Vector lineup includes three units, the newest being the 8500 that was introduced in September. The product line includes the 6500 trailer unit, 6600MT multi-temperature unit, and 5100 for stationary applications.

With the Vector 8500, Carrier introduces the first fully hermetic electric scroll compressor used in a North American trailer refrigeration unit, according to Kiefer. The scroll compressor has 70% fewer moving parts and is 200 pounds lighter than traditional reciprocating compressors.

The 8500 comes with Carrier Transicold’s ecoFORWARD technologies that boost performance while providing compliance with the Environmental Protection Agency’s 2013 Tier 4 emissions requirements. “While Carrier’s legacy Vector units are highly efficient, the new ultra-efficient 8500 achieves 5% to 30% more Btus of cooling per gallon of fuel at AHRI rating conditions,” Kiefer says.
The Vector platform’s signature E-Drive all-electric refrigeration technology means refrigeration and heating operations are 100% electric, powered over-the-road by an on-board generator driven by the unit’s diesel engine. Electric standby capability is built in, allowing truck fleets to tap into electric power supplied to run the system when parked.

Using 20% less power than previous Carrier models, the 8500 unit’s 2.2-liter diesel engine is certified for “evergreen” compliance with the EPA Tier 4 standard for engines less than 25 horsepower. For fleets operating in California beyond seven years, the Vector platform’s standard electric standby capability provides an in-use compliance option for the California Air Resources Board (CARB). Carrier Transicold also is developing an optional system that further reduces engine emissions and provides a future CARB in-use compliance Verified Diesel Emissions Control strategy.

**Electrified infrastructure**

The three fleets described at the beginning of this story have moved aggressively to install the electric standby infrastructure at the distribution center, warehouse, and fleet terminal locations their companies operate. The 460-volt three-phase power stations can cost upwards of $6,000 per unit, and a facility probably will need multiple stations to power diesel refrigeration units.

**Carrier Transicold’s new 8500 is the latest addition to the Vector line of hybrid diesel electric trailer refrigeration units.**
Hybrid power . . .

Stationary power stations. Each power station can have multiple outlets, though.

That may be enough for refrigerated fleets operating locally or in relatively short hauls. The same can’t be said for longhaul operations. Shore power electric systems are still few and far between at trucks stops and other locations where refrigerated haulers are likely to stop during longer trips.

However, Shorepower Technologies is working hard to address that shortfall. Formed to develop and deploy Electrified Parking Space units at various locations, Shorepower Technologies currently systems in place at about 70 truck stops across the United States, and the company goal is the reach 250. Twenty-nine locations have electric transport refrigeration unit (eTRU) connections.

“The infrastructure is slowly making its way across the country, as we put in eTRU 460-volt connections, along with 120-volt power for cab conveniences,” says Alan Bates, vice-president of marketing for Shorepower Technologies. “But what will transform the concept to widespread reality is more reefer fleets stepping forward for the power, and then detailing where they want it. At $2 per hour for electric power, a refrigerated trailer could save approximately 50% on energy costs versus diesel, not to mention maintenance savings. It is a very straight forward technology and benefit.

“We have the I-5 corridor on the West Coast well connected with eight locations, five of which also have eTRU plug-ins. There are more to come. We just need flagship, large reefer fleets to work with us to zero in on what’s next. I firmly believe that someday many reefer fleets will be able to conveniently enjoy the cold silence of plug-in electric power at truck stops and most everywhere they travel.

“One reason it will take time to build out the eTRU infrastructure is that demand for the system at truck stops is still low. A relatively small number of fleets are running hybrid refrigeration units, and most of those are in local use. To encourage more use of these systems, Shorepower Technologies is putting together a leasing package that bundles the refrigeration unit, trailer, and electric plug-in system for facilities.

“We see indications that hybrid refrigeration units will become more cost competitive in 2014. We think hybrid TRU prices will move closer to diesel units. The hybrid trailer unit population could reach 15% to 20% of the total refrigeration unit population over the next 10 years.”

Kiefer says he also is a true believer in truck stop electrification, and offering plug-irs for truck refrigeration units will be good for all in the industry. “Everyone wins,” he says. “We anticipate continued growth in the market as people try out hybrid refrigeration units and experience the benefits and performance they provide. As plug-ins become more widely available on the road, it will only accelerate the rate of adoption for hybrids.”
Driving savings

Fleet Owner

Brian Straight
Mon, 2013-07-08 10:22

Tyson Foods works to cut wasted fuel, miles in its private fleet

As one of the few companies that is participating in the EPA SmartWay Transport Partnership as both a carrier and a shipper, Tyson Foods has been able to garner a unique perspective on the program. And that perspective is helping drive down costs and drive up environmental benefits for the company’s private fleet.

“Working with carrier partners and what they are doing in the industry...[has] helped us a lot in terms of vehicle specs,” says Blue Keene, senior director of transportation for Tyson’s fleet.

Tyson Foods, based in Springdale, AR, is one of the world’s largest processors and marketers of chicken, beef and pork and the second largest food production company in the Fortune 500. Its private fleet recently began an initiative to “drive out miles” to meet the goals of both the SmartWay shipper and carrier programs.

Tyson’s Class 8 fleet, which numbers about 2,600 power units running a variety of equipment including day cabs and sleepers, dry vans, and refrigerated units, operates out of three base terminals in Arkansas, Pennsylvania and North Carolina. Its over-the-road sleeper fleet of approximately 1,000 trucks services customers in all 48 states with each run taking between six and 10 days. Tyson also operates a local delivery fleet and a “farm application” fleet that delivers items such as eggs, feed, birds, etc.

SLEEPER COMFORT

Each sleeper is equipped with an auxiliary power unit (APU), Keene says. The company operates 160 diesel-fired APUs and 757 electric units, 480 of which also have shorepower capability.

“We’re trying to convert our tractors so if shorepower is there, the drivers can run the comforts of that cab,” Keene says, adding that all new specs call for electric units with shorepower. The savings on the units are about 0.6 gals. per hour, per unit.

The tractor fleet is predominantly Mack and Freightliner vehicles right now, but Tyson also operates Kenworth and International tractors for evaluation as the company continually looks for the best vehicle fit.

Tyson’s trailer fleet is spec’d for aerodynamics as well, including its 2,200 refrigerated trailers, which are kept on seven-year trade cycles. Current specs on the reefer units include an undertray aerodynamic system rather than full side skirts. According to Keene, the trailer fleet is comprised of 75% skirted trailers and 25% with the tray system, although the company is still evaluating which system to use going forward.

Twenty-five Carrier Transicold Vector hybrid electric/diesel refrigeration units are also undergoing evaluation on company trailers. Keene says the units are being tested at three facilities equipped with
electric standby power. “The savings identified are absolutely there,” Keene notes, adding that a complete conversion of the fleet is unlikely in the immediate future because of infrastructure challenges. “We’ve got 2,200 trailers out there and a trailer might be in Amarillo, TX, one day and Knoxville, TN, the next. With 56 facilities served, trying to get electric power [for all of them] is not easy.”

Tyson is also planning to test compressed natural gas tractors in the fall once the new Cummins 12L CNG engine is available. The company has tested CNG tractors in the past but did not find the power output sufficient, Keene says.

“The 9L engine performance just wasn’t what we needed it to be to haul 90,000-lb. feed loads,” he says. Tyson regularly hauls through mountainous regions as well, creating added power demands. Still, Keene says the payback for natural gas is there if the power demands can be met.

“I think there is a lot of upside potential if Cummins can get that engine out there,” he adds.

Regardless of on-vehicle technology, though, Keene says an overriding criteria for any initiative is the return on investment.

Besides vehicle specs, Tyson Foods also incorporates a number of other initiatives to improve efficiency, lower costs, and improve its environmental footprint. These include the installation of PeopleNet telematics systems in the farm application tractors to measure performance of both drivers and their vehicles.

Tyson worked with shippers to consolidate shipments, thereby eliminating unnecessary routes.

“We looked through our entire network and identified high volumes of shipments,” Keene says. “If I can put two more pallets on a [trailer] and it’s a high-volume lane, then I [might] go from 12 shipments a day to 10.”

That initiative saved an estimated 3.9 million truck miles in 2011.

Like many private fleets, the Tyson fleet is also authorized to operate as a for-hire fleet to reduce empty miles. Keene says the fleet generates about $1 million a month through backhauls with about 50 customers participating in the program.

Because Tyson only ships about 40% of its product on its own fleet, the opportunity to work with other carriers and shippers has also led to changes, including altering shipper patterns where appropriate and reducing packaging to save space on trailers. Direct shipping to customers’ docks saved the company an estimated 1.5 million truck miles in 2011, the company says, while sustainable packaging efforts cut an additional 2.1 million truck miles while also reducing raw material use.

“I work with our trafficking group and help decide whether [initiatives] are best for our private fleet or our third-party shippers [or both],” Keene says. In some cases, it has meant moving shipments to rail. In 2011, Tyson says it shipped products over 18.8 million rail miles, eliminating 74 million truck miles.

Source URL: http://fleetowner.com/running-green/driving-savings
Green Fleet of the Month: Fine option

Cold-plate refrigeration paying for itself
Tue, 2012-06-05 12:08
Brian Straight

To become a major force in the world of food transport requires careful attention to detail, particularly as it relates to transporting those finished products to their final destination. Make those products temperature-sensitive salads, side dishes, dips, Mexican foods, and other specialty products, and that adds yet another layer of complexity.

But Beaverton, OR-based Reser's Fine Foods has found solutions through the use of electricity and cold-plate refrigeration technology.

"We are a SmartWay compliant company and strive to support the SmartWay goals," says Dennis Fullan, corporate fleet manager, adding that in following SmartWay best practices, the No. 1 goal remains the integrity of the cold chain. "I would like to see more electrification as it would expand our universe."

But for now, Reser's is content with using cold-plate technology across its 140-vehicle direct store delivery (DSD) fleet to maintain temperature control. Reser's uses a system from Johnson Refrigerated Truck Bodies.

The all-electric Johnson system operates much like an ice pack in a picnic cooler. Plug it in and the liquid inside the plates freezes, holding the temperature inside the truck body for up to 24 hours, depending on ambient temperatures. Most of the Reser's fleet was converted from diesel-fired units to the electric Johnson system, Fullan says.

"We were introduced to the coldplate technology when we purchased several used trucks so equipped," Fullan says. "It became apparent rather quickly how much more efficient the cold plates were—more efficient in terms of maintenance, more efficient with respect to operating cost, and more efficient from an environmental perspective."

NO IDLING ALLOWED

Fullan says the cost to operate the entire fleet for a year is now equivalent to what Reser's was spending to run 10 of the diesel-fired units before, including maintenance and fuel costs. And it ensures the company can meet its no-idling policy while maintaining the necessary temperatures inside the van bodies.

With over $700 million in annual revenue, the fourth-generation, family-owned business operates a dozen manufacturing facilities in seven states, creating a vast network of locations needed to deliver product in all 50 states and Canada. While switching to the coldplate technology provided immediate benefits, there was still the issue of the DSD vehicles reaching the distribution centers and warehouses, sometimes resulting in unnecessary miles driven.
Many of the DSD routes involve an overnight stay, Fullan says. To combat that, Reser’s is building its own network of recharging locations, installing some systems at drivers’ homes and other locations closer to their routes to cut driving time and improve efficiency. The company says that by providing more localized sites for distribution trucks to plug in, it has cut the number of unnecessary trips to centralized distribution points from daily to once or twice a week in some cases.

“It would be nice to plug in at intervals,” Fullan says. “We plug in to recharge every day. We look for layover locations that have three-phase power so we can recharge en route but these facilities are rare.”

Shorepower Technologies is helping to fix that by embarking on a federally funded program to install plug-in systems at 50 truck stops along major freight corridors by the end of this year. Many of the sites will have highervoltage connections available to plug in trailer refrigeration and cold-plate systems.

“Building this network of plug-in sites is vital not just for reducing idling while keeping drivers comfortable but for providing a cost-effective way of protecting temperature-sensitive shipments,” says Alan Bates, vice president of marketing with Shorepower Technologies. “This is a critical issue in a time of rising fuel prices. By providing low-cost grid power as a replacement for diesel fuel, we can help companies like Reser’s not only hold the line on costs but costeffectively reach new markets.”

Reser’s also employs idle-reduction equipment on its over-the-road longhaul fleet, some 130 vehicles. Thermo King refrigeration units and auxiliary power units (APUs) for heating, cooling, and power were installed. According to Fullan, the payback calculated at the time on the APUs was 18 months based on a diesel-fuel cost of $2.50/ gal. Use of the APUs also has helped to eliminate an average of 11 hours of idling per day per truck. For Reser’s, that is a cool way to run green.

Source URL: http://fleetowner.com/running-green/green-fleet-month-fine-option
All-Electric Refrigeration. A Perfect Pick For Produce Center.

Vector™ 5100 All-Electric Technology Helps Clear the Air for New England Produce Center.

Like many North American metropolitan food distribution operations, the New England Produce Center (NEPC) in Chelsea, Mass., uses stationary refrigerated trailers to manage capacity at its facility, the nation’s second largest produce market. In such applications, refrigerated units serve 24-hours a day, 365 days a year, consuming diesel fuel and adding exhaust emissions to already-stressed urban environments. The NEPC and community advocates were ripe for a change and rallied to replace nearly 100 diesel refrigeration units with Carrier’s all-electric Vector™ 5100 units. This helped to clear the air and reduce the drone of engines emanating from the center, making the NEPC a better neighbor to the residents of Chelsea while also significantly reducing fuel consumption and cutting operating costs for the center.

Carrier Solution:
All-electric Vector 5100 single-temperature units are designed for situations just like Chelsea’s. At the NEPC, the engineless units simply plug into AC power at the loading docks and quietly provide emissions-free refrigeration for on-site food storage. The result is a sharp contrast to the traditional approach of using conventional diesel-powered units.

All-electric Vector 5100 units drive diesel exhaust emissions down to zero because they do not use an engine. The Vector 5100 units are credited with ridding the local atmosphere of more than 1,025 tons of air pollutants annually. For the NEPC, they also eliminate more than 268,000 gallons of diesel fuel consumption. That alone saves an estimated $590,000 a year in operating expense, because the cost of electricity, with its relatively stable pricing, is more economical than using diesel fuel. Elimination of engine maintenance adds more savings. In short, the Vector 5100 provided bushels of benefits for both the center and the community.

For more information please visit www.trucktrailer.carrier.com
A Perfect Pick for Produce (continued)

Located along the Mystic River across from Boston, Chelsea has been identified as the third most environmentally overburdened city in Massachusetts, with some of the state’s highest reported incidences of respiratory ailments, cardiovascular disease, strokes and cancers related to diesel engine exhaust pollution. This densely populated suburb is crisscrossed with diesel corridors for trucking, shipping and airport traffic. The NEPC alone has 37,000 truck deliveries each year.

Given this situation, the leadership of the community-based non-profit Chelsea Collaborative Inc. identified ways to improve the local atmosphere and then took their case to the U.S. Environmental Protection Agency. The EPA responded with a grant to help support proposed emissions-reducing programs, the largest of which was for the NEPC’s Vector 5100 units and corresponding facility upgrades to provide electrification at the loading docks.

Bushels of Benefits

The Vector 5100 is based on the refined all-electric refrigeration system architecture of Carrier’s successful Vector 6500 single-temperature transport refrigeration unit (TRU). A hybrid unit, the Vector 6500 uses a diesel engine and electric generator for on-highway power and offers plug-in electric-standby capability when parked near “shore power,” such as at a loading dock. Vector systems have fewer moving parts compared to conventional belt-driven mechanical TRUs, providing many benefits, such as quieter operation and reduced maintenance requirements.

The Vector 5100 delivers the same quiet, emissions-free performance as the Vector 6500 on electric standby, without the added expense of the power plant – the engine, radiator, exhaust system, fuel filter, air cleaner and generator are examples of components that were eliminated. Although the Vector 5100 is intended for stationary situations, it is designed to be road-worthy for transport to other locations, having been qualified to handle shock, vibration, corrosive road salts and other challenges, the same as a standard over-the-road TRU.

Requiring just an AC power supply, the all-electric Vector 5100 delivers best-in-class capacity – 59,000 BTU of cooling at 35°F setpoint and 100°F ambient temperature. It is designed for near-silent operation and exceptionally low lifecycle costs. Maintenance-free electric motors drive its evaporator fan and condenser fans. The semi-hermetic compressor has no shaft seal to wear out. Heating, when needed, is provided by electric-resistance elements, rather than hot gas. It also uses Carrier’s quiet V-force™ condenser fans and high-performance Novation™ condenser coil.

Healthy Outcome

The impact of the installation, which was handled by Carrier Transicold of Boston, has been significant. “The program is working very smoothly,” said Brian Eddy, general manager for the NEPC. “It’s definitely quieter and we don’t have the exhaust fumes. To me the air seems a lot cleaner.”

Using U.S. EPA data that relates environmental emissions to healthcare costs, the Chelsea Collaborative and M.J. Bradley and Associates calculated a $78 million, 10-year economic benefit to the community associated with reduced health outcomes anticipated from the NEPC installation.

“It is so gratifying to work on a project that brings about significant air quality improvements,” said Roseann Bongiovanni, associate executive director of the Chelsea Collaborative. “Replacing old, dirty diesel engines that ran throughout the day, every day, with quiet, clean, electric Carrier Vector 5100 units, has significantly reduced diesel emissions in Chelsea. By eliminating hazardous pollutants that pose numerous serious health consequences, this project will bring about lasting improvements to ambient air.”

“It is so gratifying to work on a project that brings about significant air quality improvements.”
— Roseann Bongiovanni, Chelsea Collaborative

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Carrier Transicold
NATT-CASE 2012-001
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HYBRID REEFER SYSTEM HELPS MILE HI FOODS CUT FUEL COSTS

Western food service distributor Mile Hi Foods Co. says it is saving an estimated $85,000 annually in fuel costs while also improving the sustainability of its operations, thanks to the electric standby capability of its 27 Carrier Transicold Vector multi-temperature trailer refrigeration units.

A specialty food service company serving more than 300 national brand restaurants across eight states, Mile Hi Foods began adding Vector multi-temperature units to its fleet in 2007. Within the past year, the Denver-based company completed the infrastructure needed to introduce electric standby at its central distribution center.

As hybrid diesel-electric systems, the Vector units have all-electric refrigeration architecture. Unlike mechanical refrigeration systems, the diesel engine is dedicated to one function: driving a high-performance generator that powers the compressor, fans and operating system. When stationary, Vector units can be plugged into an electric power source, eliminating the need to run the engine and generator.

Mile Hi Foods added 17 460V electrical outlets to its loading docks and installed 20 freestanding receptacles in its yard so that loaded trailers can be parked and run electrically while waiting to be dispatched. When taking advantage of electric standby, fuel is conserved, emissions are eliminated, noise is reduced, and operating savings of 40 to 70 percent can be achieved, depending on the price of fuel and electricity at any given time, according to the company.

The acquisition of Vector units with electric standby capability "was a good business decision," says Tony Tadдонio, president of Mile Hi Foods. "The driving factor was when fuel got up to $4 a gallon. It made us rethink a lot of what we were doing. As we considered how we could save energy, we saw the sustainability benefits, too. This was perfect. It fit everything we wanted to do."

Mile Hi Foods calculates monthly savings of 1,800 gallons of fuel by using electric standby, which over the course of a year reduces its fuel expenditure by more than $85,000, enough to pay for the infrastructure investment.

Carrier dealer CT Power of Commerce City, Colo., supplies Mile Hi Foods' refrigeration units. Based on its success with the Vector units, Mile Hi Foods recently acquired 13 Vector 6500 single-temperature units for its specialty foods operation. Like its multi-temp sibling, the Vector 6500 is a diesel-electric hybrid with electric standby capability.  

"The driving factor was when fuel got up to $4 a gallon. It made us rethink a lot of what we were doing."  
Tony Tadдонio, president, Mile Hi Foods

Jack Roberts
Fleets will be the beneficiaries as hybrid reefer technology continues to improve

By Carol Birkland

Monday, May 24, 2010

Fleets that specify hybrid reefers fit a specific profile. Primarily, they are larger fleets that have a sustainability metric in place, which includes ways to reduce emission—and these fleets are really leading the way toward greater acceptance of the technology. But they are not only pioneering the new reefers, they are benefiting from the cutting edge technology that is helping them better serve their customers.

Evolving hybrid technology
Hybrid reefer technology can be divided into two primary types: electric standby units that rely on diesel operation over-the-road with the ability to plug into an electric power source at the dock (like Thermo King’s SmartPower and Carrier’s Deltek), and true over-the-road hybrid operation, which utilizes alternator power or stored battery electricity to power the unit, without diesel power, while the unit is driving down the road (like Thermo King’s Hybrid SmartPower).

Electric standby
Thermo King truck and trailer units are available with SmartPower electric standby operation, which allows for the unit to be run on electric shore power when at the dock, saving fuel and virtually eliminating emissions. SmartPower, which Thermo King has been refining for over 50 years, also reduces noise, lowers maintenance costs, extends the lifespan of the reefer and cuts operating costs by up to 75%. Thermo King has added a high-output version of SmartPower, which is available on select Thermo King trailer units. The addition of the new SmartPower HO provides the choice of a 24 HP high-output electric standby option or the existing 14 HP version.

The option delivers quicker pre-cool and less run time for customers hauling larger frozen loads, along with a greater overall cooling capacity.

“In trailer systems currently available in the marketplace, a diesel engine is required to operate the refrigeration system while the truck is going over the road. In distribution centers where there is loading and unloading, electric power is available to help reduce emissions and save fuel while docked,” says Tom Kampf, trailer product manager at Thermo King. “The adoption of electric standby continues to grow at a significant rate.”
Over-the-road hybrid operation
In addition to SmartPower electric standby, Thermo King also has developed a true over-the-road Hybrid SmartPower option, which the company says uses the stored energy from the truck chassis battery system to run the refrigeration unit electrically over the road. This technology reduces energy consumption and noise while maintaining product temperature effectively.

Hybrid SmartPower unit has three modes of operation:
- Tier-4 Diesel Engine
- Hybrid SmartPower supplied by truck lithium ion batteries
- SmartPower supplied by shore power

Other characteristics of Hybrid SmartPower include:
- Utilizes Chassis Export Power (i.e. battery pack or alternator/generator)
- Up to 60% less fuel
- Up to 60% less emissions
- Up to 87% less noise and vibration
- Extends life of reefer engine and lower annual maintenance cost

“This technology is a direct response to customers' requests for help in meeting their sustainability goals,” says Scott Bates, truck product manager at Thermo King. “We’ve made significant progress in fuel, emissions and noise reduction.”

Carrier Transicold’s hybrid reefer, Vector 6600MT, is a multi-temperature trailer refrigeration system designed to improve capacity while reducing fuel consumption and emissions, the company said. The unit provides up to 20% greater fuel efficiency than its predecessor, the 1800MT, Carrier said.

According to David Kiefer, director of marketing and product management for Carrier Transicold, “Whether your needs are for single-temperature long hauls or multi-temperature distribution for the grocery and food service industries, Carrier hybrid technology now offers capacities that are comparable to, or exceed, our industry-leading conventional refrigeration units.”

The Vector 6600MT has 9% more capacity than Carrier’s original multi-temperature hybrid and 15% more than the nearest multi-temperature competitor at the same conditions, the company said. At a set point of -20 degrees F, the capacity is as much as 15% greater than the conventional unit. Deltek technology uses its diesel engine exclusively to drive a high-performance 20KVA electric generator that powers an all-electric refrigeration system, according to the company.

Maintaining hybrid reefers
As for maintaining hybrid reefers, technicians are going to need to be aware that these new units have fewer mechanical parts and more sophisticated electrical components, including inverters. As a result, diagnostics are going to play a more important role in troubleshooting problems and servicing units.

According to Bates, Thermo King has improved and upgraded the T-Series diagnostic capabilities, adding more detailed downloads, in addition to making sure Thermo King technicians at over 200 locations nationwide are certified in hybrid maintenance. FE
E& MU: Plug-In Power Cools Cargo, Helps Shippers Go ‘Green’

By Eric Brothers, Contributing Writer
Special to E&MU

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The need for total control of the “cold chain” — every point in a refrigerated shipment’s environment — is driving demand for more efficient ways of maintaining cargo temperature during the transfer of goods between dock and trailer.

Dock seals that leak, ever-larger dock spaces and, in no small part, California’s continued assault on diesel emissions, are invigorating the adoption of electrical shore power for refrigerated trailers.

“Since the doors of the trailer are open, the TRU [trailer refrigeration unit] winds up trying to help cool the entire dock instead of just the interior trailer space,” said David Kiefer, director of marketing and product management for Carrier Transicold, Syracuse, N.Y. “The TRU is generally running highly loaded and at high speed, which means it is potentially at its loudest and consuming diesel fuel at a high rate.”

Electrical power provides the benefits of holding cargo temperatures steady at the dock and helping reefer carriers while enabling their warehouse customers to “green” up their operations.

“Not only is the TRU much quieter on electric power with the [reefer’s] diesel engine shut off, but operating savings of approximately 40% to 70% can be achieved due to the lower cost of electric power versus diesel operation,” Kiefer said.

Sales of shore-power-capable TRUs are up 400% over the past few years, said Thomas Kampf, Thermo King Corp.’s trailer product manager for North America. Though still small overall, the segment is growing exponentially, he said.

In addition to the fuel savings electric standby offers, it also complies with diesel emissions rules that have taken effect in California and that other states are contemplating.

California requires reduction in emissions from the small diesel engines that for so long have provided refrigeration power for road and rail shipping. Options are diesel particulate retrofits, replacement of older equipment with low-emissions products, and shutting off the unit’s engine and plugging it into the electrical grid.

Tim Minor, Thermo King’s national account manager, said, “Legislation is a game-changer that can
require customers to respond quickly in the way they operate.”

Minor also cites a growing customer focus on measurably reducing environmental effects.

Fresh Express Inc., a subsidiary of Chiquita Brands and known for its ready-to-eat packaged salads, installed electrical hookups at its loading docks in Salinas, Calif.

Its carrier partner, Brent Redmond Transportation, Hollister, Calif., uses the power hookups to run its trailer units with Thermo King’s SmartPower electric standby option instead of running the units’ diesel engines.

Since starting the program in January with six hookups, Fresh Express has prevented the release of at least 77 pounds of carbon into the atmosphere each day, said Thomas Shepherd, vice president of transportation for Fresh Express.

Moreover, he added, it costs 25% to 30% less to pre-cool the trailer with electricity than with diesel power.

Fresh Express estimates emissions reduction from the project when fully implemented could be as much as 30,000 pounds of carbon dioxide in a year — in addition to other benefits of the electrical approach to trailer refrigeration: less noise, longer TRU life span, reduced maintenance and overall lower life-cycle costs.

Brent Redmond Transportation runs Thermo King’s SB-210+ units with its SmartPower electric-standby connections.

Carrier Transicold, which splits the trailer refrigeration market with Thermo King, offers an all-electric unit under the Vector label that the company said not only provides about the same performance on electric standby as it does in diesel operation, but it also is designed around a hybrid diesel-electric power system for on-road use.

Carrier’s most advanced on-board technology is a 2.2-liter diesel engine driving an electric generator, which powers the refrigerator compressor’s electric motor. This motor eliminates the conventional belt drive between engine and compressor, which Carrier said reduces maintenance requirements. Carrier introduced its “hybrid” system in 2005.

Witte Bros. Exchange Inc. hauls less-than-truckload frozen, processed and refrigerated foods throughout the United States and recently invested in a 460-volt, three-phase AC-power infrastructure at the company’s Troy, Mo., terminal to support shore-power operation of 50 trailers.

Brent Witte, president of Witte Bros., said the fleet operates Carrier’s Vector hybrids with integrated electric standby. With the trailers at the terminal two or three days a week, he said, he expects a reasonable payback period, despite the costs of the equipment.

Witte plans to replace all of his TRUs with electric standby models because he believes it is a good tool to show customers that they are minimizing their carbon footprints by using his company.

He also said he likes that the hybrids have fewer moving parts. His regular TRUs last five years, and he hopes the hybrids will extend that life cycle to seven to 10 years before trade.

“We’re always looking for a good cost-effective use of technology and efficiency,” Witte said. “In trucking, the only way you’re going to survive is to find your efficiencies.”
Fresh Express and Brent Redmond Transportation Team Up for Sustainability

Thermo King’s SmartPower™ Electric Standby Saves Fuel and Reduces Emissions

Fresh Express, Inc., of Salinas, Calif., and Brent Redmond Transportation of Hollister, Calif., have joined together in an effort to reduce emissions at the Fresh Express facility in Salinas.

Fresh Express, a wholly-owned subsidiary of Chiquita Brands, is the number one maker of fresh salads in the United States and sold the first ready-to-eat packaged salad in grocery stores nationwide in 1989. Founded in 1987, Brent Redmond Transportation, Inc., is one of the leading refrigerated transportation companies in the western United States.

As part of their deep commitment to environmental sustainability, Fresh Express began the emission-reduction project by installing electric power hookups at the loading docks of its Salinas facility.

Next, Fresh Express brought in Brent Redmond Transportation, which utilizes Thermo King SB-210+ trailer units with SmartPower™ electric standby. The units run without using diesel engines at the loading dock. While the trailers are being pre-cooled and loaded, the units operate from the electric power hookups. Brent Redmond Transportation has purchased six of the units so far, and has plans to purchase more as additional hookups are installed.

SmartPower electric standby, available on the Thermo King SB-210+ trailer units that Brent Redmond is using as well as other Thermo King trailer units, delivers many environmental and cost-saving benefits beyond reducing emissions. Those benefits include less noise, reduced maintenance costs, a reduced life cycle cost and a longer lifespan for the unit.

Since starting the program in January, Fresh Express has prevented the release of at least 77 pounds of carbon from entering the atmosphere each day, according to Tom Shepherd, vice president of transportation for Fresh Express. Shepherd noted that the savings they are realizing could drive expansion, since it costs 25 to 30 percent less to pre-cool the trailer with electricity than with diesel power.

"This program is a continuation of Chiquita's commitment to environmental sustainability," Shepherd said. Michael Johanson, who handles transportation, co-manufacturing, warehousing and logistics for Chiquita Brands International, said the estimated annual emissions reduction from this project could be as much as 30,000 pounds of CO2.

The two companies worked closely with Thermo King of Salinas, Inc., to get the program set up. "Brent Redmond Transportation has been a leader in technology and equipment since the company was founded," said Alvin Trentelman, chief executive officer at Thermo King of Salinas, Inc. "It was the first California-based carrier to install Qualcomm and one of the first to use Thermo King’s OptiSet™ and Pocket Wintrac™ products as well as OptiSet™ Plus, which they used to create named temperature profiles specifically for Fresh Express loads. The company’s use of the new SB-210+ units with Smart Power offers another plus for customers!"

Thermo King Corporation, a business unit of diversified industrial firm Ingersoll Rand Company Limited, was founded in 1938 and manufactures transport temperature control systems for a variety of mobile applications, including trailers, truck bodies, buses, shipboard containers and railway cars. The company operates 10 manufacturing facilities and 17 parts distribution centers worldwide. Sales and service is provided by a global dealer network of 865 independently owned companies in 75 countries.

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Background

Plugging into the Grid Saves Big

The Vector® system’s all-electric architecture makes it perfectly suited for stationary electric standby operation, in which the hybrid unit plugs into grid power and runs like a large, sophisticated electric refrigerator. With the diesel engine off while the trailer is being used for loading, staging or cold storage, diesel fuel is conserved, exhaust emissions are eliminated and noise is reduced. In addition to being an environmentally sound strategy, standby operation also reins-in operating costs because electricity is less expensive than diesel fuel. The comparison below uses the latest U.S. government data for energy costs.

Estimated Standby Savings
(High-speed mode, high-capacity demand)

<table>
<thead>
<tr>
<th>Cost Of Operation - Diesel</th>
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| Hourly fuel consumption   | 1.15 gal  
| Cost per gallon diesel fuel* | $2.92  
| Cost per hour to operate on diesel | $3.34  

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<tr>
<th>Cost Of Operation - Electric Standby</th>
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| Power consumption                   | 14.3 kilowatts  
| Cost per kilowatt hour**            | $0.1024  
| Cost per hour to operate on electric standby | $1.46  

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<tr>
<th>Cost Savings - Electric versus Diesel</th>
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| Savings by operating on electric standby | 56%  

While present operating cost savings for standby service is 56 percent, fluctuating diesel fuel prices over the last two years have afforded a savings potential of 40 to 70 percent.

Reducing the engine’s runtime provides maintenance benefits as well, extending engine preventive maintenance service intervals and adding to the life of major components, such as the engine and generator, which are not used during electric standby.

Using standby power is also a potential emissions compliance option with the California Air Resources Board (CARB). Under current legislation, if a user follows certain rules and maintains proper documentation, then the operator never has to modify the engine emissions of that unit. That means no engine retrofits or add-on exhaust treatments, each of which generally has a starting price of $5,000.

Some conventional mechanical systems can be adapted with add-on standby components, which add considerable mechanical complexity without delivering nearly as much performance as a Vector hybrid. When plugged into electricity, a Vector 6600MT or Vector 6500 unit can deliver 100 percent refrigeration capacity under most conditions, whereas some optional standby assemblies deliver only about one-half the standby performance compared to diesel operation.

*Average on-highway price of diesel, March 15, 2010 U.S. Department of Energy (DOE)
**Average commercial price of electricity, 12-month rolling average, period ended Nov. 2009, DOE