

## Hailing the King of Cool Innovation



*Willis H. Carrier*

On July 17, Carrier employees around the world commemorated the 110th anniversary of the invention of modern air conditioning by Dr. Willis Haviland Carrier. That achievement, of course, gave rise to Carrier Corp., and eventually to Carrier Transicold, now both a part of UTC Climate, Controls & Security.

No matter where you go in the Carrier world, the innovative spirit of Dr. Carrier continues to this day. And you can read about it in our new book, *Weathermakers to the World* (visit [williscarrier.com](http://williscarrier.com)), chronicling the rich history of Carrier Corp. and our legacy of innovation.

We are a company of ideas, committed to research and development. Our heritage inspires us to reach the next innovative, powerful and marketable idea, as evidenced by groundbreaking products such as our new NaturalLINE™ container refrigeration technology, which harnesses CO<sub>2</sub> natural refrigerant for reduced carbon footprint plus energy savings; the industry best-selling PrimeLINE® unit, which significantly reduces power requirements, lifecycle costs and emissions for shipping lines; and PowerLINE® generator sets with ecoFORWARD™ technologies for fuel-saving compliance with the latest emissions standards.

Managing the process of innovation is discussed in this issue by Carrier Transicold Program Manager Mike Griffin, who has helped lead several of our “coolest” product development initiatives that are true to the legacy of our founder.

Also featured in this issue is OPDR, a customer with a rich legacy of its own that has embraced the PrimeLINE unit’s innovation as the right choice for its needs today. And with the adjacent article, we’re excited to update you on the sea trials of our NaturalLINE units, which continue Carrier’s tradition of cool innovation, inspired by our founder, to meet the challenges of the modern world.



*Kartik*

**Kartik Kumar**  
Director of Marketing and Strategic Planning  
Global Container Refrigeration



## NaturalLINE™ Update

This year, Carrier Transicold’s innovative NaturalLINE™ container refrigeration unit has been developing its “sea legs,” logging tens of thousands of both nautical miles and hours of real-world service through what is proving to be a highly successful trial program.

The NaturalLINE unit is the first container refrigeration system to use the natural refrigerant CO<sub>2</sub>, with a global warming potential of only 1, rather than a synthetic refrigerant. Engineered to deliver power consumption efficiencies equal to Carrier Transicold’s PrimeLINE® unit, the NaturalLINE unit’s use of CO<sub>2</sub>, improves the environmental profile further.

This makes it an attractive consideration for customers who are interested in sustainable solutions and eager to participate in Carrier Transicold’s 2012 NaturalLINE sea trials.

As of August, a progressively growing number of NaturalLINE units had been put into service among four customers, a group that includes Hapag-Lloyd, the pilot participant in the original demonstration unit trials in 2010 and 2011.

The NaturalLINE units have successfully delivered a spectrum of products, ranging from Caribbean-grown bananas to Belgian beer and European wines to cookie dough, ice cream, meat and cheese. The units have operated over the full range of temperature settings on routes crossing the Atlantic and Pacific oceans on trips ranging from four days to 28.



## - CO<sub>2</sub> a Natural Success in Customer Trials

Each trial unit is equipped with GPS and GSM telemetry devices so Carrier Transicold can closely monitor location and performance. When units are within range of GSM services they automatically transmit their status, which Carrier monitors over the Internet. Upon arrival in port, Carrier Transicold field service engineers are there to download full operational reports for every trip.

Mark Rogers is Carrier Transicold's Service Engineering lead on the sea trials program and monitors the NaturalLINE fleet via a special website.

"We can see all of the units' temperatures, setpoints, alarm settings and last location. I get alerts via email or text if something occurs, like a unit being shut off or if a temperature setting is changed."

Rogers reports that the program has gone well. "So far, it's been smooth sailing."

Training of service center personnel and customer crews has also been important, since the NaturalLINE design introduces some new hardware, such as a multi-stage compressor, a gas cooler coil and variable-speed drive.

Carrier Transicold's comprehensive training programs for sea trial customers has garnered positive feedback from their service technicians. Many have commented about the design being less complicated than expected and that the training helped to dispel concerns about working with the higher pressure system.

Rogers, who is also involved in the service training program, said that once technicians get familiar with the units, they find them to be "characteristically like any other Carrier unit – easy to work on and easy to understand." That may also be a reflection of how Carrier approached the development of NaturalLINE.

"Service Engineering was involved from the ground up," Rogers said, "which gave us the chance to address serviceability issues along the way."

The design process remains ongoing throughout the trials, according to Mike Griffin, Carrier Transicold's program manager. Hardware and software refinements are made at key stages and well before the NaturalLINE units go into full production.

"Ultimately, our production units will incorporate many improvements based on experience we have gained from the sea trials and extensive qualification testing completed in our engineering labs," Griffin said.



*Technicians will find NaturalLINE™ units to be characteristically similar to other Carrier units.*