

TRUCKING COMPANIES EMPLOY BEST PRACTICES

Transport providers find best practices can provide better service, fuel savings, and consistent quality of product.

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Transport providers find best practices can provide better service, fuel savings, and consistent quality of product.



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ANY COMPANY THAT transports refrigerated or frozen products knows that running these operations is not easy. Customer expectations, operational best practices, regulations, and legal issues and more are all everyday concerns.

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It cultivates, fosters and develops commercial and trade relations between organizations engaged in all aspects of producing, importing, exporting, transporting, warehousing commodities requiring temperature and/or atmospheric controls and related services:

Members include trucking companies, rail lines, ocean carriers, ports, refrigerated warehouses that offer transportation, and others connected with cold chain transportation.

The value of IRTA to members is in providing expertise in regulatory compliance, legal affairs, and operations. IRTA can provide the following critical benefits:

- **Government Affairs** – Assisting with regulatory compliance, specifically with the U.S. Federal Motor Carrier Safety Administration (FMCSA) and the U.S. Food and Drug Administration (FDA).
- **Operations** – Providing answers on operational best practices in refrigerated transportation.
- **Food Science** – Providing access to

World Food Logistics Organization (WFLO) scientific advisors to help with food handling, safety, and temperature management issues. WFLO is another core partner of GCCA.

- **Legal Assistance** – Providing access to an attorney with expertise in transportation services to review customer contracts, assist with claims, and handle other legal issues.

IRTA is also focused on member recruitment. Many types of companies can benefit from IRTA membership, but one of the key areas is commercial truck carriers. While several associations serve the trucking industry, none are solely focused on refrigerated transportation, as is the case with IRTA.

Smaller carriers in particular will find tremendous benefits in IRTA, which is positioned to provide critical advice quickly when it is needed by a company.

I encourage all GCCA members to consult the new 2013-14 Global Cold Chain Directory and do business with IRTA members, who are listed in “Transportation” section. Also, if you work with companies that are not yet IRTA members, please encourage them to join and direct them to www.gcca.org for more information. ☎

JOHN WILLIAMSON
Chairman, IARW

COLDFACTS

COLD FACTS magazine is published every other month by the **Global Cold Chain Alliance (GCCA)**, an organization that unites partners to be innovative leaders in the temperature-controlled products industry. The GCCA Core Partners are:

The **International Association of Refrigerated Warehouses (IARW)**, which promotes excellence in the global temperature-controlled warehouse and logistics industry.

The **World Food Logistics Organization (WFLO)**, which delivers education and research to the industry and empowers economic development by strengthening the global cold chain.

The **International Refrigerated Transportation Association (IRTA)**, which cultivates, fosters and develops commercial and trade relations between all those engaged in the transportation and logistics of temperature-controlled commodities.

The **International Association for Cold Storage Construction (IACSC)**, which provides a forum for innovative ideas, promotes standards of practice, and sponsors professional education programs for the cold storage construction industry.

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PIONEERING INSULATED METAL PANEL TECHNOLOGY



By Lowell Randal

The proposed rule applies to FDA registered food facilities, which includes facilities such as refrigerated warehouses, processors and manufacturers. Congress provided an outline for preventive controls in the FSMA legislation using hazard analysis and critical control point (HACCP) principles. Operators of a facility would be required to understand the hazards that are reasonably likely to occur in their operation and to put in place preventive controls to minimize or prevent the hazards.

Although this proposed rule is very similar to HACCP, it differs in that preventive controls may be required at points other than at critical control points and critical limits would not be required for all preventive controls.

Facilities will be required to prepare and implement a written food safety plan, which would include the following:

- A **hazard analysis** that identifies and evaluates known or reasonably foreseeable hazards for each type of food manufactured, processed, packed or held at the facility.
- **Preventive controls**, which would be required to be identified and implemented to provide assurances that hazards that are reasonably likely to occur will be significantly minimized or prevented.

Preventive controls would be required to include, as appropriate: (1) process controls, (2) food allergen controls, (3) sanitation controls, and (4) a recall plan. However, the preventive controls required would depend on which, if any, hazards are reasonably likely to occur.

FOOD SAFETY MODERNIZATION ACT UPDATE

The FSMA proposed rule on preventive controls and its impact on the cold chain.

The Food Safety Modernization Act (FSMA) was signed into law by President Obama in January 2011. Since that time, the U.S. Food and Drug Administration has been working to implement the legislation.

One of the centerpieces of FSMA is the focus on using preventive controls to improve safety at food facilities. On January 4, 2013, the FDA released its proposed rule for preventive controls for food facilities, which has been one of the most anticipated rules coming out of FSMA. The proposed rule had been delayed at the Office of Management and Budget for over a year due to the complexity of the rule as well as the run up to the 2012 presidential election.

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It is unlikely that all possible prevention measures and verification procedures would be applied to all foods at all facilities. FDA believes a supplier approval and verification program is a risk-based and appropriate control to significantly minimize or prevent hazards from raw materials and ingredients that is consistent with current scientific understanding of food safety practices and is seeking comment on such a program.

- **Monitoring** procedures to provide assurance that preventive controls are consistently performed and records to document the monitoring.
- **Corrective actions** that would be used if preventive controls are not properly implemented. Facilities would be required to correct problems and minimize the likelihood of reoccurrence, evaluate the food for safety and prevent affected food from entering commerce when necessary.

If specific corrective action procedures were not identified for the problem, or if a preventive control

were found to be ineffective, the facility would also be required to re-evaluate the food safety plan to determine if modifications are needed.

- **Verification** activities to ensure that preventive controls are consistently implemented and are effective. Verification activities might include validation that the preventive controls are adequate for their purpose and are effective in controlling the hazard, activities to verify that controls are operating as intended and review of monitoring records.

In addition, the proposed rule would require reassessment of the food safety plan at least every three years and at other times as appropriate. FDA recognizes that product and environmental testing programs are science-based verification activities that are commonly accepted in many sectors of the food industry and is seeking comment on these programs. FDA also is asking for comments regarding review of customer and other complaints as part of verification.

- **Recordkeeping.** Facilities would be required to keep a written food safety plan, including the hazard analysis. They also would be required to keep records of preventive controls, monitoring, corrective actions, and verification.

The proposed rule would exempt some facilities from the preventive controls requirements. For example, dry warehouses solely engaged in the storage of “unexposed” packaged products are exempt from the preventive controls requirements. This exemption is being proposed due to the recognition that these facilities pose a significantly lower food safety risk. FDA has indicated that “unexposed” pertains to food that is packaged in such a way as to prevent human contact. As a result, totes, crates and similar packaging would not be considered “unexposed.”

Another exemption is for facilities that have an FDA HACCP plan for juice or seafood. This is the most likely exemption available for refrigerated warehouses.

While a full exemption is only likely for those facilities that have an FDA HACCP plan, some refrigerated warehouses will be subject to a set of modified requirements. FDA is proposing that facilities solely engaged in storing unexposed packaged food requiring temperature control for safety be subject to modified requirements. These modified requirements recognize that qualifying facilities pose a lower food safety risk, and that the primary risk is temperature abuse.

GCCA supported a petition filed with FDA outlining the reduced risks of warehouses and suggesting that it is not necessary for warehouses to be subject to additional regulations under the preventive controls rule.

FDA proposed modified requirements include:

- Establishing and implementing temperature controls
- Monitoring the temperature controls
- Taking appropriate corrective actions when there is a problem with temperature controls
- Verifying that temperature controls are consistently implemented
- Establishing and maintaining the following records:
 - Records documenting the monitoring of temperature controls
 - Records of corrective actions
 - Records documenting verification activities.

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Some of the specific benefits of qualifying for the modified requirements are:

- Facilities would not need to develop their own food safety plan.
- Facilities would not have to conduct an individual hazard analysis or reanalysis.
- Written procedures would not be required for monitoring temperature controls.
- Written procedures would not be required for corrective actions.
- Verification and reanalysis of temperature controls would not be required.

The GCCA Government Affairs Committee has been analyzing the preventive controls rule and the proposed modified requirements for facilities engaged in the storage of unexposed refrigerated packaged product. GCCA agrees that modified requirements centered on temperature control are appropriate for refrigerated warehouses storing unexposed packaged food.

FDA is now in the process of collecting public comments on the proposed rule. As a part of that process, FDA held a public

meeting on February 28 and March 1, 2013, to discuss the preventive controls proposal. As GCCA Director of Government Affairs, I attended the public meeting and gave oral comments to FDA leadership regarding the proposed rule. I expressed appreciation for FDA's recognition of the lower food safety risks presented by refrigerated warehouses. I discussed the unique role that the third party logistics industry plays in the food supply chain and pointed out places in the proposed rule that need further clarification. I also stressed the importance of FDA providing a strong training program for inspectors that includes information on third party logistics. At press time, GCCA was preparing more detailed written comments to FDA, due in May 2013.

Once the public comment period ends in May, FDA will analyze the comments received and consider potential revisions to the rule. This process will take several months. The final rule for preventive controls may not be available until late 2013 or even 2014. The final rule will become effective 60 days after it is published. However,

facilities will still have one year to come into compliance before FDA begins enforcement activities on the new rule.

In addition to engaging with FDA on the proposed rule, GCCA is also developing materials to increase awareness of the preventive controls rule for members of the cold chain. GCCA will offer a webinar to discuss more details of the proposed rule on preventive controls. The webinar will be open to all members and take place at 2:00 p.m. (EST) on Thursday, May 23, 2013. Watch for more webinar details in *Cold Connection* and on the GCCA website. ☎

LOWELL RANDEL is the Director of Government Affairs for the Global Cold Chain Alliance.

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TRUCKING COMPANIES EMPLOY BEST PRACTICES

Transport providers find best practices can provide better service, fuel savings, and consistent quality of product.

Best practices are used in nearly every industry and profession to achieve a high standard or to reach customer satisfaction. While the phrase “best practices” is often regarded mostly as buzz, it is a method or technique that has consistently shown superior results over those achieved by other means. In other words, it can be used as a benchmark or as a standard for improvement.

In the cold chain, trucking companies often regard best practices as requirements laid down by big customers like Walmart and Costco. Others associate them with standards set by agencies such as the U.S. Federal Drug Administration (FDA) Food Safety Modernization Act (FSMA) and the Safe Quality Food (SQF), British Retail Consortium (BRC), and International Food Standard (IFS).

“Best practices are important for the industry’s quest for perfection and safety,” comments Jim Gray, Marketing Manager for K&J Trucking.

Some best practices are actually “good” practices or “smart” practices that surround operational issues the refrigerated transportation industry in the United States faces daily. These regard trailer temperatures, reefer settings,

standard practices, and duty hours and logs.

“Best practices are important because it is critical that the cold chain and product integrity are maintained so that all safety standards are met or exceeded,” stresses Maria Wittmeyer, Vice President Transportation Manager for Burris Logistics.

It’s so important that some transport companies leverage relationships with other companies to benchmark how they are doing and identify opportunities for improvement. C.R. England does this with carriers with whom it does not compete.

“There are certain topics, such as safety, that even our direct competitors are willing to benchmark says,” Ron E. Hall, director of Operations Technology for C.R. England - Global Transportation.

Trailer Temperatures

One key area worthy of best practices is the maintaining of trailer temperatures, particularly since refrigerated products can warm during transit. Jim Thompson, emeritus extension professor, UC-Davis and president of Post Harvest Engineering LLC, has studied the issue extensively. “The bigger the difference between the outside and the carrying temperature inside the trailer, the greater the temperature will raise in transport,” he stresses.

For example, table grapes and stone fruit transported at 31°F (-0.6°C) from California to Quebec rose 2.2°F (-16.6°C) - front of the trailer - to 1.8 °F (-16.8°C) - middle of trailer - to 1.4°F (-17°C) - back of trailer over the course of three to five days. Temperatures also varied depending upon where inside the trailer the product was stacked. “That which was carried on the floor was the warmest and gained anywhere from 1.1 to 4.1°F (-17.2 to -15.5°C),” he says.

In another test, frozen products transported three to four days at a set point temperature of 0 °F increased by 11°F (-11.7°C) - back of trailer; 22°F (-5.6°C) - middle of trailer; and 7°F (-13.9°C) - front of trailer. That on the top of the load warmed much less.

“The only product I didn’t see warm during long distance transport was cut flowers,”

Thompson says. “That could have been because there is not a lot of weight in the truck.”

He also found that during spring or late fall, outside temperatures and carrying temperatures were not much different. In the winter, heat must be provided for chilled products to prevent chilling and freezing. In the summer, if temperatures rise in the trailer, decay and ripening will occur.

More critical is the point at which the trailer is opened. But if warehousing shipping and destination points are sealed and have refrigerated temperature controlled loading docks, there should be little variation in temperature conditions. The only exception is an open dock that is open to the outside.

Loading and Unloading Practices

One best practice most transport companies agree on, and one that is primarily customer driven, is the pre-cooling of a shipment prior to backing the trailer into a dock door.

“Once you are ready to back into a dock, turn the reefer off, open the doors, and load or unload the shipment as quickly as possible without the reefer unit running,” Hall says.



The biggest problem during transport is that the refrigeration has to produce cold air and that air has to be distributed in the trailer to intercept heat on the outside as well as in and around the load.”

— JIM THOMPSON, *President of Post Harvest Engineering LLC*

“When the job is complete, back away from the dock, close the doors and start the reefer back up.”

Gray admits that he used to regard pre-cooling a waste of energy. However, after listening to experts, he admits it has value. But Gray still maintains that if product is introduced into the trailer at the right temperature, and the reefer is set at the correct setting, pre-cooling can be minimized since the product will quickly be at the correct temperature.

Proper loading into well maintained equipment will also minimize warming. Pallet loads need to be unitized, and, in loading, an air space kept around the load. Also impor-

tant is how the trailer is to be loaded (center-line or staggered).

“The challenge with center loading is you have to stabilize the product,” Thompson explains.

This is not easy. It involves using locks, unitized pallets, and blocking between the load and walls to keep the pallet away from the walls where it can be impacted by vibration from driving over the road.

“It also takes extra time and cost,” he adds. “Plus, you lose some interior volume, although this not necessarily critical,” says Thompson.

Systems, such as air packs or self-adhesive corrugated strips, are available that help brace the loads away from the walls.

“The biggest problem during transport is that the refrigeration has to produce cold air and that air has to be distributed in the trailer to intercept heat on the outside as well as in and around the load,” Thompson emphasizes. “There needs to be a gap between the inside walls and the product itself. This will allow the least amount of warming.”

It’s also important that the refrigerated systems are properly collaborated.

While some might think that having the reefer unit run while the trailer doors are open helps maintain the temperature of the product, this is not the case.

“As long as the reefer doors are closed, even with the reefer turned off, it should continue to operate normal and maintain the temperature,” says Wittmeyer. “Most companies also find that having the reefer unit pause or turned off maintains a better temperature than having all of that warm air pulled into the trailer.”

In fact, operating the reefer with the rear doors open will not cool down the cargo. “If you open rear doors while the reefer unit is running, you have the potential to draw in warm moist air and drive the dry, cold air out the back of the doors,” remarks Hall. “This could damage the product that is in the trailer and cause the refrigeration unit to go into defrost mode too quickly. This does not cause

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damage, but it is not healthy for the product.”

He explains that reefer trailers are designed such that when the trailer doors are open, cold air shoots out the back and is not cycled back against the doors and underneath the load like it does with the doors shut. By turning the reefer unit off, warm air is prevented from being drawn into the reefer compartment. In fact, the introduction of hot ambient air will heat up the cargo instead. That’s because when hot humid air enters the reefer, moisture condenses on the cold cooling coil and turns to ice. Ethylene entering the reefer from genset exhaust may also cause the ripening of fresh produce, and exhaust odor may taint the product’s flavor.

Another potential hazard is once the loading is complete and the doors are closed, it’s possible that the reefer could run for hours with a partially iced up cooling coil, thereby reducing its cooling effect and putting the cargo in danger until the unit completes a defrost cycle.

As a standard, reefers can vary 15°F to 20°F (-9.4°C to -6.7°C) s when put into defrost.

“The variation depends on how much moisture is in air,” says Gray. “If it’s a humid

day, it may take the unit some time to heat up to achieve that variation.”

Most experts concur, however, that reefers do not experience much temperature variation when they go into defrost because the units have electric fans that shut off during defrost. “There is no airflow during defrost. It’s only heating up coils in the unit,” says Brent Witte, president of Whitte Bros. Exchange. “Therefore, there is minimal, if any, temperature drop.”

Nevertheless, many shippers and receivers have the driver run the reefer unit while the trailer is turned off.

“There are many reasons they do this,” Gray says. “The dock may not be warm or cool enough, or someone decided they needed air blowing, or the driver might even be cold. Nothing has been achieved except varied temperature is being introduced into the trailer, thereby extending the period of time it will take to bring the product down to the correct temperature.”

To counter the practice, trucking companies are increasingly employing transit dataloggers, or telematics, to track and time their drivers as well as perform tasks such as reefer tempera-

ture management. K&J uses a system called Blue Tree Temperature Management by Blue Tree Systems. One component of the system is when the trailer doors are open, it automatically shuts the reefer unit off. This helps companies like K&J save substantially on fuel costs and manage equipment.

Gray admits that K&J finds some resistance to the technology and some will even try to trick its circuitry. But shippers also benefit from the system. The feature saves millions of perishable goods from spoiling, and is designed for stringent health and safety regulations being introduced in Europe and North America.

“We can monitor and give the shipper a minute-by-minute report as to what the trailer temperature is while carrying the product,” Gray says. “We can also change the temperature en route if the settings get out of range.”

Consequently, increasing numbers of shippers request this technology. “You must have it to work for them,” Gray says.

Trailer Cleaning Practices

Maintaining clean trailers is a uniform best practice applied to the transport industry

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by the shipper. In between loads, trucking companies require drivers to sweep every trailer out.

“At the minimum, the dunnage (packaging materials, plywood, left over pallets) gets removed. Some customers require that the trailer also be washed out with a pressure wash, which we do on a regular basis,” Hall reports.

In extreme cases, some companies will contract to have the trailers steam cleaned. “But this is rare,” reveals Hall.

“Much depends on the product you are hauling,” Wittmeyer says. “If we are hauling product that is all cartonized and palletized and is a dry product, we will sweep. If something has leaked, caused cross contamination or an odor, we will wash it out between loadings.”

Overall, trucking companies error on cleanliness and act quickly to keep their trailers clean. That’s because a huge percentage of their business is done via metrics.

“We are measured by our on-time pickup and delivery,” Gray says. “You surrender that the minute you present the truck at the dock and have to take it away because it is dirty.”

Duty Hours and Logs

Duty hours and logs are one and the same where best practices are concerned. Today both are made more manageable by employing paperless or electronic logs.



“Currently, approximately half of our fleet is capable of doing e-logs,” reveals Wittmeyer.

The idea is to track the duty hours of shipment, truck and driver, and log the hours of every driver, as dictated by Federal Motor Carrier Safety Administration (FMCSA) rules.

All trucking companies are subject to numerous variables over which they have no control, such as weather, traffic, unloading delays, driver illnesses, and accidents. “All impact our ability to be effective, particularly for the last mile in that supply chain,” Wittmeyer says.

The key to success is well-maintained equipment and trained, professional drivers, who have decision-making ability and are capable of working closely with customers to expedite loading and unloading. “It’s not for the faint of heart,” Wittmeyer adds.

Gray maintains that best practices factor in by adhering to today’s rules and regulations, collecting driver hours every day, and doing proper trip planning in conjunction with the driver to make sure there are enough hours to complete the run.

“You have to be experts in relay – taking one driver who does not have enough hours off one run and putting him on another with shorter, lesser requirements, then finding a driver that has adequate hours to replace him,” he says.

K & J’s biggest concern is when shippers

change the requirement for a load while a driver is en route with the load. “It’s here where some of new rules and regulations do not make sense such as the 34 hour restart or the rolling of 10 hours back from 11 hours of driving,” Gray says.

Another best practice is informing every one of delays. “Shippers know we cannot make up for anyone else’s mistakes but our own,” Gray adds.

Consequently, some companies like C.R. England integrate electronic on-board recorders (EOBR) into their planning processes to effectively plan the correct load based on each driver’s log-in hours.

“FMCSA controls those log requirements,” Hall says. “C.R. England keeps track of those electronically. The driver has a keyboard tool in the truck that they use to log in and out of each duty status.”

Their duty status is captured in real-time. Based on the information provided by the electronic tool, the transport company knows what available log hours the driver has in the future.

“We use that information to make decisions on load assignments,” Hall explains. “We want to make sure the load assignment is not putting the driver in the position of having too few log hours to complete it.”

It also allows the transport company to act proactively. “If at any time during that load a

driver reaches the point where he or she does not have enough hours to complete the load, we try to find another driver who can complete that load on time," Hall states.

Even if the company cannot solve the service issue, it can give the customer advance notice with a reschedule request for the load.

More upstream are best practices regarding efficient tractor and trailer utilization.

"There are a host of best practices around equipment utilization, some of which involve the customers; some of which do not," Hall states.

One example is the customer's efficient loading and unloading of the truck so that the driver does not have to waste log hours at the customer's location. "One of the ways we get around that is we position drop trailers so that the customer can load and unload without the driver there," Hall explains.

But this can bring up issues regarding reefer fuel. "Some customers respect the use of the trailer while it is on their lot and do not run our reefer unit unnecessarily," Hall says. "Some do not."

If the customer leaves the refrigeration unit

running, not only does this burn fuel; it creates additional maintenance requirements on the refrigeration unit.

Other issues include tractor utilization such as if a driver is running ahead of schedule.

This creates similar issues to running behind.

"We try to identify drivers who are running ahead, and proactively offer them alternatives," Hall says.

Weakest Link

Scores of reasons point to why transportation is still the weakest and hardest link to manage in the cold chain.

For one, states Witte, is the fact the low cost of entry into the transportation industry is enabling marginal players to compete.

"Third party logistics operators (3PLs) and brokers have a tendency to underprice items," Witte says. "This, in turn, forces established and reputable carriers to refuse to carry product."

Another difficult area comes from the fact that when trucking firms sign the bills of other shippers, they become the owner of the product and are trusted to handle or claim

any loss that occurs.

Also important, shippers need to know with whom they are contracting to move their freight. "They need to ask important questions, such as is your equipment California Resources Board (CARB) compliant," Gray says. "If you are running a truckload in California, you can get a load out of there with a noncompliant trailer, but you cannot come into California with a load."

To do that, a truck must operate with a carbon plant loader, which takes in dirtier air than it expels.

The bottom line: truck trailers are getting increasingly more expensive. To combat the cost, best practices centered on efficiency and utilization must be implemented to help trucking companies have some pull in watching their expenses. ☞

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GREAT PLACES

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LOVE TO WORK

Several cold chain companies recently won awards for being great places to work. Find out what makes them different.

By Alexandra Walsh



Photo courtesy of The Raymond Corporation



We take pride in how we hire and manage because we want to stand out as a premier employer and a company that's easy to work for, which in turn says a lot about our customer service.”

— BILL DANIEL, *Henningsen's Human Resources Manager*

Best practices are used in nearly every industry and profession to achieve a high standard or to reach customer satisfaction. While the phrase “best practices” is often regarded mostly as buzz, it is a method or technique that has consistently shown superior results over those achieved by other means. In other words, it can be used as a benchmark or as a standard for improvement.

What does your company do to attract and retain good employees? What sets it apart from the competition and other places people might choose to work?

Several GCCA core partner member companies recently won awards recognizing the excellent workplaces they provide their employees. Whether it's month-long vacations, use of the company ranch, professional development, or citizenship classes, these four companies all share a common philosophy – employees come first because it's the right thing to do and because it makes good business sense.

Setting Employees Up for Success

Henningsen Cold Storage was recently recognized as a winner of the 2013 Premier Employer Award by the Northwest Food Processors Association (NWFPA).

“We're very proud of the award because it shows we're doing the right thing for our associates,” says Bill Daniel, Henningsen's Human Resources Manager. “We take pride in how we hire and manage because we want to stand out as a premier employer and a company that's easy to work for, which in turn says a lot about our customer service.”

Daniel says Henningsen believes in getting its associates involved in the company and ensuring that they're successful and invested in its operations. “The associates in our warehouse are the front line that our customers see and investing in their education makes for a good experience for everyone,” he explains.

Part of that investment includes sending 10-12 employees to the WFLO Institute every year for the past couple of decades. “It's a big expense for us but we do that because we want them to understand the entire cold chain process and see the whole business and the big picture,” explains Daniel. “We're also sending them the message that we believe in them and are willing to invest in their careers because we want them to do more and become future leaders in our organization.”

In addition to the WFLO Institute, Daniel says Henningsen provides tuition reimbursement and an extensive intern and manager trainee program. “We do so much to promote from within because we want our associates to know our culture, our business and our customers. We want them to be successful and be with us for a long time.”

Employee Engagement

Primus Builders was recently named one of Atlanta's Top 100 Workplaces by the *Atlanta Journal-Constitution* and ranked 13th out of 50 businesses in its size category.

Richard O'Connell, President of Primus Builders says, “Our ranking speaks volumes about our employees' enthusiasm and about how they do their jobs. Primus Builders is a great place to work and we hope that shines through in how we deal with everyone in our industry.”

Primus operates on a philosophy that it is only as good as its people. In addition to employee benefit programs that are at or above industry standards, including short-term disability and a matching 401(k) program, the firm invests in its employees' professional aspirations, according to Primus Executive Vice President Erik Gunderson.

“We are great believers in continuing education, whether that is providing the latest and greatest technology and the support and education to implement it or sending our folks to GCCA conventions and conferences and other industry educational seminars to meet and learn from their peers and industry experts,” he says.

Internally, the company holds production meetings in which employees are encouraged to collaborate and share ideas. “It's an opportunity for our entire population to get together and talk about what's new and what's going on in the company,” Gunderson explains. “We take the opportunity to present sessions on new industry technologies from fire protection to high-tech doors to ensure our employees know they're on the cutting edge of the industry as well as to reinforce for them that they're part of something – the Primus community.”

He sums up by saying, “At the end of the day, it all goes back to what we learned in kindergarten. You treat people the way you would want to be treated.”

Working Has Its Perks

Bellingham Cold Storage (BCS) also won the prestigious NWFPA Premier Employer Award.

“The award was a really nice confirmation of the work that we have done for many years,” says Doug Thomas, BCS President and CEO. “All our department heads feel strongly and passionately about creating a positive, excellent employee culture. We want our employees to love coming to work and feel good about being part of a team that cares about them.”

In part, the award recognized the company’s on-site medical clinic (described in the article, “Cold Chain Innovators” in the July-August 2012 issue of COLD FACTS), but also for other innovative programs at BCS that promote economic opportunities for low-income employees. One of those is the company’s Workplace Literacy Program, which assists non-native English-speaking workers and their families in their day-to-day cultural challenges.

“We pursued this program originally because we believed the future leadership of this company would come from all different types of cultures. We had superstars coming from Latin America on a seasonal basis that were such high performers, we wanted to invest in them and give them leadership training,” explains Thomas.

“To make that possible, we hired an instructor to provide ESL (English as a Second Language) between shifts. We have had a remarkable level of participation by very committed employees who are there because they



Five Bellingham Cold Storage employees being recognized with certificates, jackets and other gifts at the company’s 2012 Employee Awards and Appreciation Event.

want to move up in the company or maybe they just want to be able to read a bedtime story in English to their child.”

Because BCS is dedicated to promoting from within and giving all its employees an opportunity to grow with the company, it began offering citizenship classes to BCS employees who were working there on a temporary visa. “We have 11, soon to be 12, employees that have gone through our ESL and citizenship programs and have applied and received U.S. citizenship,” confirms Thomas. “We’ll be preparing our next graduation ceremony soon, complete with a huge cake with a U.S. flag on it.”

Reflecting on the company’s motivation for these programs, Thomas says, “Our employees that are beneficiaries of the ESL, citizenship,

or any of our other programs feel strongly that the company is investing in them. And even if they’re not in one of our programs, they feel pride that their company is doing this for their fellow employees. That engenders long-term employee loyalty – the average tenure at BCS is 17 years and we have many employees who have been here more than 40 years.”

Values, Sabbaticals, and a Ranch

ARCO Design/Build, Inc. was named to the Best Places to Work list by the Atlanta Business Chronicle. The company was ranked 16th out of more than 400 applicants in the small business category and was the highest-ranked construction firm.

“I believe we won the award because we have a positive, energetic environment where company interests and associates’ interests are in alignment,” says ARCO CEO Rick Schultze.

“We have four core values and one core purpose at ARCO and the first core value is to treat people fairly and do the right thing,” he says. “The second core value is to understand our customer’s business and solve their problems; the third is to be positive, upbeat, and have fun; and the fourth is to create opportunities for individual financial success based on merit. Our core purpose is to make the design/build construction process enjoyable and beneficial for our associates and customers.”

Schultze points out that associates, not customers, come first in the company’s core purpose. “We believe that customers’ business needs will cycle up and down but a good associate will be here for life.”

And to sweeten the incentive for its associates to stay, ARCO has a unique sabbatical program that allows every employee to take a month of paid leave every five years, in addition to their annual leave. “Our industry

CASTLECOOL HONORED WITH “GOLD STANDARD” AS A DELOITTE “BEST MANAGED COMPANY”

Many factors go into making a company a great place to work, and high-quality management is one of them.

Castlecool, one of Ireland’s leading providers of cold chain solutions, was honored as one of Ireland’s “Best Managed” companies in the Deloitte Best Managed Companies Awards Programme for the fourth year in a row. The award criteria include management strength, ability to innovate, strategic initiatives and financial performance.

Companies that have been recognized as a Best Managed Company for four consecutive years are awarded with a special “gold standard” accolade. Castlecool was one of 14 companies designated with the gold standard this year.

Paul Shortt, Managing Director of Castlecool said, “Everyone here at Castlecool is very proud of this achievement. I want to acknowledge the hard work and dedication of all the staff and management in achieving the award.”

“Castlecool has an outstanding employee retention rate – and the longevity and stability of the workforce is critical to our continuing success.”

is fairly demanding with long hours and hard work and everyone takes advantage of the sabbatical,” says Schultze. “If our employees travel, which we encourage, we contribute \$3,500 to help defray their costs. Our employees have traveled all over the world, taken extensive RV trips, or just broken up the month with family visits, vacation and ‘honey do’ lists.”

The company also just bought a ranch in the Georgia mountains that includes wooded mountain hiking and a fishing pond with a dock. The primary purpose of the ranch will be a getaway for associate training and biannual company meetings, but employees will also be able to use it free of charge on weekends. “It will sleep 38 now and after future renovations will sleep 68 so that will make for some great family reunions,” says Schultze.

“I’m very proud to be associated with all of our ARCO team and all my other partners feel this way. It’s very fun to come to work!”

Going from Good to Great

When asked what he would advise a new CEO considering the importance of programs for the benefit of the physical, emotional and profes-



The ARCO ranch in the Georgia mountains includes wooded mountain hiking and a fishing pond with a dock and is available to associates on weekends.

sional well-being of their workers, Bellingham’s Doug Thomas replied, “You have to decide what level of the market you intend to operate in – are you a Nordstrom or a dollar store? If you want to function at a higher level you have to think about things that set you apart and attract the best and brightest employees, loyal customers, and dependable vendors.

“If you want to go from good to great, think about employing some of these programs,

devote yourself to good employee practices and customer service, and you’ll be paid back in spades.”

ALEXANDRA WALSH is Vice President of Association Vision and a contributor to *COLD FACTS*.

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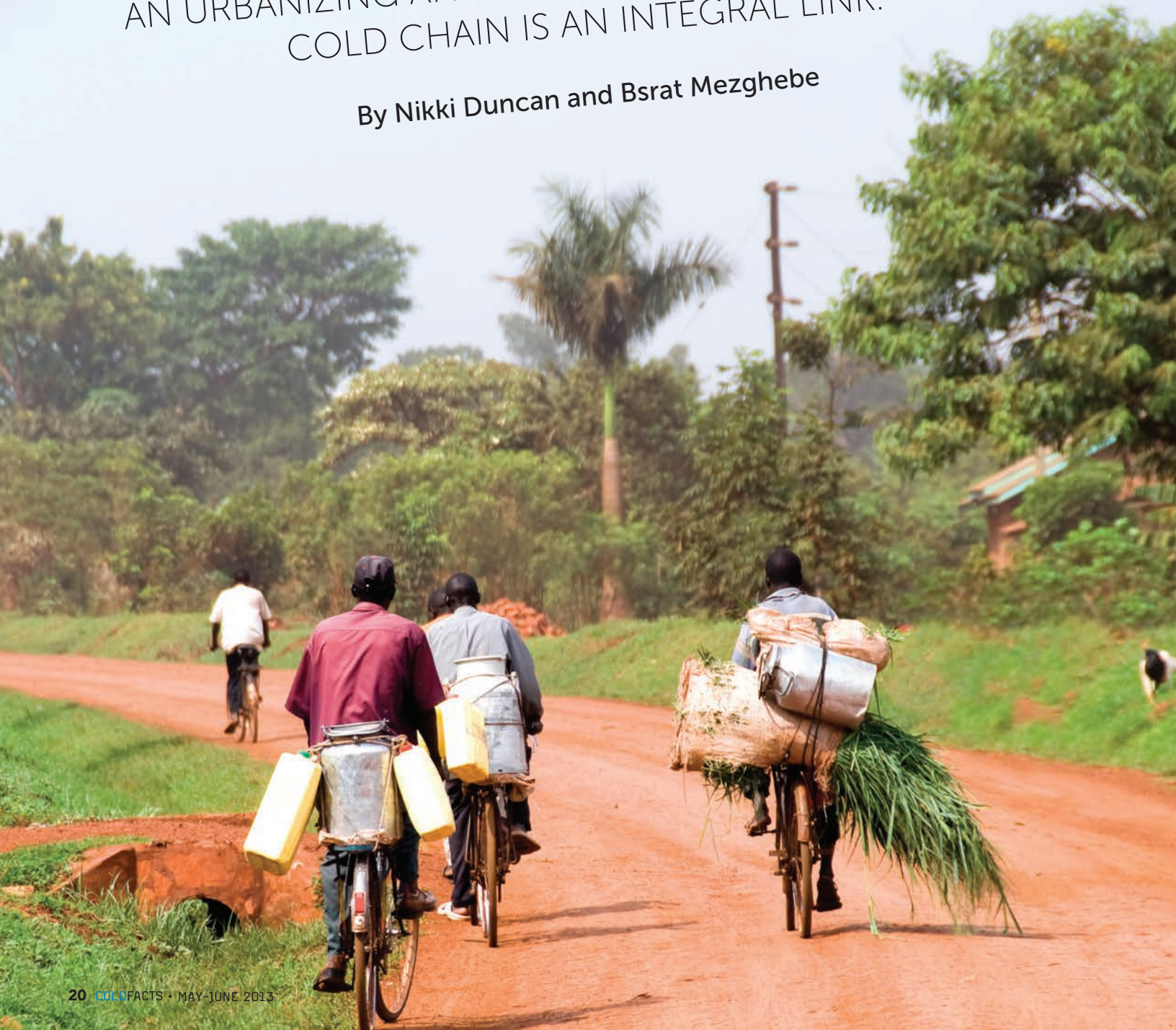
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A CONTINENT IN TRANSITION

FOOD DEMANDS ARE INCREASING RAPIDLY IN AN URBANIZING AFRICA AND AN ADVANCED, ROBUST COLD CHAIN IS AN INTEGRAL LINK.

By Nikki Duncan and Bsrat Mezghebe





frica is undergoing profound changes. Boasting the world's highest birth rate, it is experiencing population growth faster than any other continent, with its current population of 1 billion expected to double over the next 40 years.

This transformation is most keenly felt in African cities. Forty percent of Africans currently live in cities, and by 2030, that will rise to 50 percent. That urban population will represent \$1.3 trillion in spending power.

Africa's current urbanization follows last decade's demographic trends in China and India, which helped fuel transformative economic growth.

Africa is also witnessing steady economic progress. The International Monetary Fund (IMF) has reported GDP growth of 5.3 percent since 2010. It also identified seven African countries out of the world's top 10 performing economies from 2011-2015.

On the ground, this has resulted in the fastest growing middle class in the world. As of 2010, 313 million Africans, comprising 34 percent of the population, were considered middle class, comparable to their Indian and Chinese counterparts. The African Development Bank defined the African middle class as those spending between \$2 and \$20 a day. While this range seems low by developed world standards, it's appropriate given the lower cost of living in Africa. Furthermore, Africa has more middle-class households with incomes of \$20,000 or more than India.

Rising Food Demand

These twin forces of urbanization and economic growth are creating a surging consumer base that is acquiring mobile phones, cars, appliances, and services faster than generations before.

African consumers have also changed food procurement and consumption patterns, as dietary preferences differ between urban and rural residents. Urban diets are more diversified, consisting of higher quality meat, fish, and dairy products, as well as fruits and vegetables. Wheat and rice are preferred to traditional starch products, including cassava and sorghum.

Following global trends, urban Africans are also consuming more processed and packaged food. These changes will result in greater grocery sales, as urban households purchase more food than rural ones. Accordingly, urban African food markets are expected to exceed \$400 billion by 2030 and the total food and beverage market is projected to increase from its current value of \$313 billion to \$1 trillion by the same year. Significant investment in processing, logistics, and retail networks will be required to meet this growing need.

WORLD'S TEN FASTEST-GROWING ECONOMIES*

Annual Average GDP Growth, %

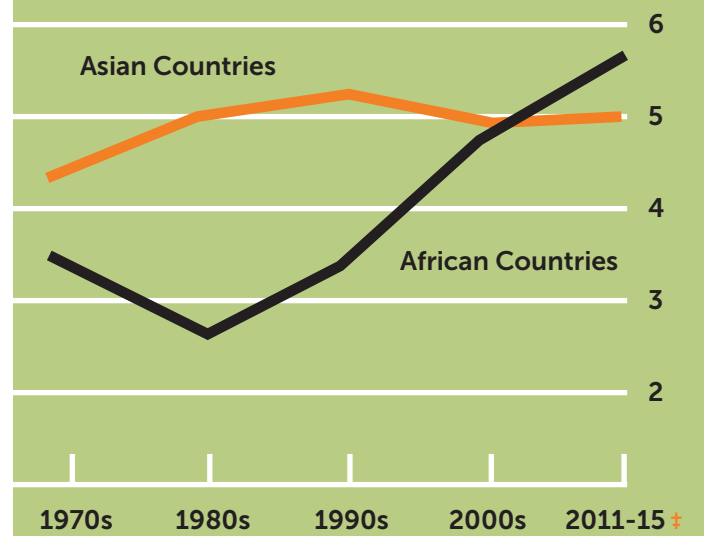
2001-2010 †

Angola	11.1
China	10.5
Myanmar	10.3
Nigeria	8.4
Ethiopia	8.2
Kazakhstan	7.9
Chad	7.9
Mozambique	7.9
Cambodia	7.7
Rwanda	7.6

2011-2015 †

China	9.5
India	8.2
Ethiopia	8.1
Mozambique	7.7
Tanzania	7.2
Vietnam	7.2
Congo	7.0
Ghana	7.0
Zambia	6.9
Nigeria	6.8

GDP GROWTH, UNWEIGHTED ANNUAL AVERAGE, %



Sources: *The Economist*; IMF

*Excluding countries with less than 10m population and Iraq and Afghanistan

† 2010 Estimate † Forecast

	POPULATION (MILLIONS)	TOTAL NO. OF FORMAL RETAIL STORES	FORMAL RETAIL STORE PER MILLION PEOPLE	GDP PER CAPITA (USD)
South Africa	48.0	2264.0	47.2	\$7,100.8
Botswana	1.8	44.0	24.4	\$6,795.9
Swaziland	1.1	24.0	21.8	\$3,072.8
Nigeria	138.3	1.0	0.0	\$1,324.3
Zambia	11.7	18.0	1.5	\$1,286.1
Ghana	23.4	1.0	0.0	\$761.9
Lesotho	2.0	9.0	4.5	\$707.9
Tanzania	40.2	9.0	0.2	\$542.5
Uganda	31.4	2.0	0.1	\$503.8

Sources: Afena Capital; IMF

Despite Africa's natural agricultural competitive advantage, it is a net food importer, with cereals, meat, and dairy products representing at least 50 percent of all food imports, and cooking oils and sugar comprising another 20 percent. Continued domestic demand is likely to increase imports, at least in the near term, until domestic production is able to satisfy local needs. As such, domestic and regional markets offer the most attractive opportunities for food production, processing, and storage.

A closer look at 2010 food retail stores in select African countries also reveals the potential for growth. South Africa, with the most developed retail market, has a population of 48 million and 2,264 stores. Tanzania boasts a comparable population and only nine stores. The difference can be explained by the stark income disparity, affirming that countries with the greatest prospects for household income growth will see the greatest transformations in their food industries.

The Rise of QSRs

Food retailers see the African continent as "the new frontier". In particular, multinational quick service restaurants (QSRs) have committed to expanding operations throughout the continent.

The fast food behemoth Yum Brands has opened four Kentucky Fried Chickens (KFCs) in Ghana in 2012, and has announced plans to open 1,200 KFCs in Africa by 2014. The Subway sandwich chain has opened approximately 30 restaurants in Africa and according to the Wall Street Journal, is planning to open 20 stores in Kenya over the next six years. Domino's Pizza Inc., opened two restaurants in Nigeria in August 2012, and plans to open more than two dozen outlets in Egypt, Morocco, Kenya, and South Africa.

QSR growth has proven to be a key driver for cold chain industry growth in many emerging markets, particularly in China. The growth of QSRs throughout many of Africa's larger economies is a clear sign for future demand for 3PL services as retailers look to maximize profits and reduce costs.

Growth Opportunities for Cold Chain Development

Through its International Program initiatives, GCCA has provided technical expertise in 17 African countries. Given the diverse nature of the economies, the following sections provide a general overview of the cold chain infrastructure and opportunities for business development.

A Parmalat truck delivering to a local supermarket in Lusaka, Zambia.



Southern Africa: Cold Chain Gurus

Southern Africa is by far Africa's most developed region in terms of cold chain infrastructure. GCCA has 20 member organizations based in the region, predominantly in South Africa (18), Mauritius (1), and Namibia (1).

As an emerging market economy, and one of the largest economies on the continent, South Africa has a very well developed cold chain logistics infrastructure. Industrial refrigerated warehouses in Johannesburg, Cape Town, and Durban rival those in the United States or Europe in terms of modern construction, equipment, and operational best practices.

Commercial Cold Storage Group Ltd. is the most dominant member in the region with nine warehouses in South Africa and one in Namibia, offering 100,000 metric tons frozen capacity plus 10,000 tons fresh, and interest in further expansion.

James Cunningham of South Africa-based Barpro Storage SA (Pty) Ltd., believes that the growth in demand for cold storage in South Africa increased significantly in the early 2000s due to the reduction of income inequality in



You're The influx of cheap imports of frozen poultry and frozen vegetables has led to a rise in [food supply] which, in some instances, has to be stored."

— JAMES CUNNINGHAM, *Barpro Storage SA (Pty) Ltd.*

the post-apartheid era. According to Cunningham, "Previously disadvantaged South Africans wanted a western lifestyle and were easily persuaded to buy more frozen foods." Despite the global economic downturn in 2008, Cunningham suggests that there is still a strong demand for frozen foods in South Africa. "The influx of cheap imports of frozen poultry and frozen vegetables has led to a rise in [food supply] which, in some instances, has to be stored."

Other countries in the region are making strides to develop their own cold chain industries. The regional expansion of South African supermarket chains and increased presence

of international processors like *Parmalat* are fueling this demand for cold storage services.

North Africa: Gateway to Europe and the Middle East

Despite its recent turmoil, North Africa has extraordinary geopolitical and economic significance, largely due to its proximity to European markets and linkages to oil-rich Gulf States.

It is home to several emerging market economies, namely Egypt and Morocco, where cold chain infrastructure is relatively developed. Some of GCCA's newest members are based in Morocco, with four companies

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A pack house and storage facility in Agadir, Morocco.

having joined over the last six months.

Cold chain development in Morocco is taking off, a result of strong political will by the government and demand for high-quality supply chain services to facilitate increased trade under the US-Morocco Free Trade Agreement. As a large exporter of citrus and tomatoes to the United States, Morocco is looking to expand its cold chain industry.

This past fall, the Moroccan ambassador visited the Port of Wilmington in Delaware, which annually receives 10-20 tons of clementines from Morocco. According to Delaware Governor Jack Markell, “The importing deal has created 100 jobs at the port since it started in 2000.”

East Africa: The Continent’s Fastest Growing Economies

According to the IMF, East African countries such as Ethiopia, Rwanda, and Tanzania have been growing at rates of 7-9 percent.

Syngenta, the agri-business leader, is hoping to double its revenues in Africa by 2020, starting with further market penetration in Kenya and Tanzania. Syngenta has also joined several other companies such as Unilever, Dupont, SAB Miller, and Diageo as partners with the Government of Tanzania in the Southern Agricultural Corridor of Tanzania (SAGCOT), a partnership designed to improve agricultural productivity, food security and livelihoods. The Tanzanian government has also developed an agri-business promotion program, which includes road construction and support of 25 cold storage facilities.

Residing with his family in Kenya, James “Rusty” Eason, former employee of GCCA member companies Atlas Cold Storage, now VersaCold and Meridian Cold Storage, is witnessing the growth opportunities in Kenya. He remarks, “Women have entered the workforce and are looking for easier options for food preparation. The need for cold storage is growing in order for Kenyans to have greater access to ready-to-eat food.”

West Africa: Home to Africa’s Most Populous Country

While West Africa is arguably the poorest region on the continent, Nigeria, the economic and demographic powerhouse, gives the region supreme commercial significance.

With a population of more than 158 million people and an economy that has grown consistently at a rate above 7 percent over the last three years, Nigeria boasts a large and vibrant food retail food sector. Imported manufactured goods well exceed sales of locally processed consumer goods, which implies a heavy reliance on cold chain infrastructure of imported proteins, dairy, and fruits and vegetables for domestic consumption.

In February 2013, GCCA sent a team of experts to Nigeria to assess the opportunities for food logistics infrastructure investment. The results revealed the critical need for cold storage to serve the growing market for imported and processed goods, as well as the inadequate utilities and transportation infrastructure.

Ghana is West Africa’s most stable country, with strong economic growth and a well-

functioning democracy. As a large pineapple exporter to the U.S. and EU, Ghana is continuing to invest in cold chain infrastructure to improve the export quality of its fruit and vegetable sector. In August 2008, GCCA provided technical expertise to the Government of Ghana to assist in the design and tender of a perishable cargo center at Kotoka International Airport, as well as several field pack houses for its largest horticultural exports.

Moving Forward

Although the optimism for Africa is deserved, there are challenges to cold storage business development, including inadequate road infrastructure, costly and unreliable electricity, and political instability. These challenges vary throughout the continent and companies should evaluate individual countries’ business operating and regulatory environments. Most importantly, however, urbanization and growth in the food retail sector indicate attractive business opportunities worth further exploration. ☺

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HYPOXIC FIRE PROTECTION

Are hypoxic air fire protection systems an option for PRWs? A study looks at the pros and cons of low-oxygen fire suppression systems

By Sheryl S. Jackson

The potential costs of fire in a refrigerated warehouse can add up quickly. Loss of goods, damage to the building and equipment, and interruption of business operations can be the result of the fire as well as fire suppression efforts.

Even when completely covered by insurance, no owner wants to undergo the disruption to warehouse's business as well as the business of other members of the supply chain.

A fire protection system that inhibits the start of flaming fire by creating a low-oxygen, or hypoxic, environment that is safe for people but not conducive to combustion is one solution beginning to receive interest among refrigerated warehouse owners, engineers, and fire protection professionals.

"I've been curious about the system for a while," says Don Wiginton, chairman and chief executive officer of Wiginton Fire Systems and lead author of an IACSC-IARW Construction/Codes Committee white paper on hypoxic air fire protection systems.

No hypoxic system is yet installed in a U.S. cold storage warehouse. In fact, uses are limited to areas where water suppression is not an option, such as computer centers or museums. "Hypoxic air systems are not right for all applications, and won't replace fire sprinkler systems as the best overall solution to unwanted fire, but it appears they have some promise for the right application," says Wiginton.

The concept of hypoxic air fire protection is to reduce the oxygen content from 21 percent to about 15 percent by essentially increasing the content of nitrogen in the environment. Sensors continuously monitor the content of oxygen in the air and trigger the release of nitrogen when the oxygen content rises above 15 percent.

The potential advantages of the system for PRWs include eliminating water in a freezing environment along with pipes in pallet racks that are vulnerable to damage by fork lifts.

The design limitations of a traditional fire suppression system related to ceiling heights, product commodity hazards, and available water supplies might also be eliminated with creation of a low-oxygen environment, says Wiginton.

Potential Advantages Include Cost Savings

Cost is another advantage described by warehouse owners in Europe, where the system is commonly installed. European contractors have reported initial installation costs of low-oxygen systems as one-half to one-third the cost of a sprinkler installation. Results of Wiginton’s research do not show that dramatic a savings, but only one study has been conducted by the committee, he points out.

The cost comparison included in the white paper, “Controlled Atmospheric Fire Protection,” came from a project handled by



It is also important to constantly measure the gas content of the environment so it doesn’t become a potential tinder box without any fire protection.”

— DON WIGINTON, *Wiginton Fire Systems*

Ted Elicker, P.E., co-author of the paper.

“My initial estimates for a rack system for an automated storage/retrieval system (AS/RS) freezer warehouse in Massachusetts rose due to the ceiling height and need for booster pumps,” Elicker explains. “I was familiar with European use of low oxygen fire protection systems so I investigated the use of the system for this warehouse.”

The initial estimate for a traditional installation was \$490,000 and the estimate for the initial installation of a hypoxic fire protection system ranged from \$425,000 to \$550,000, with the lowest cost based on zero

leakage and the higher based on 30 percent leakage of air.

With no low oxygen fire protection system installed in a U.S. cold storage warehouse, estimates for leakage have to include worst case scenarios. Controlling the level of oxygen in the air is optimum when the atmosphere can be managed and natural infiltration is not a big factor, points out Wiginton.

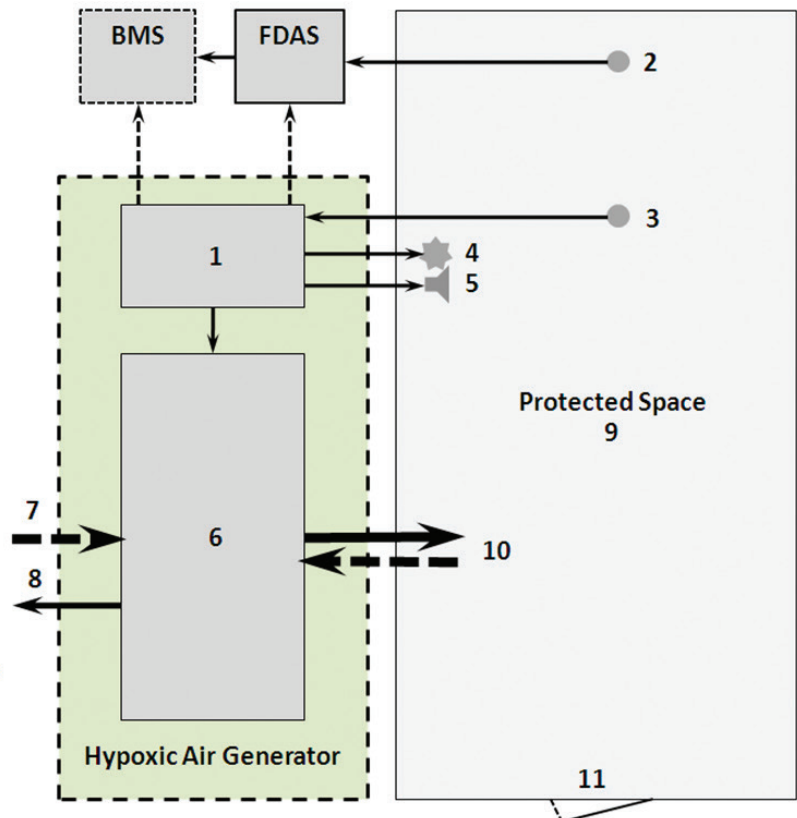
This poses a problem for most of the typical PRW facilities because trucking and fork lift operations require doors to be opened and closed frequently, which allows infiltration of oxygen-rich air. “However, in automated

Hypoxic Air Fire Prevention Concept

Hypoxic air generating systems are available in a number of methods. Figure indicate basic functions only.

- 1 Control panel and power supply
- 2 Smoke detection
- 3 Oxygen monitoring
- 4 Strobe light
- 5 Sounder
- 6 Air splitting unit (generator)
- 7 Ambient air (optional)
- 8 Oxygen enriched air out
- 9 Hypoxic air
- 10 Air Exchange (ambient air ventilation and infiltration not shown)
- 11 Access

FDAS Fire Detection and Alarm System
BMS (optional) Building Management System





CONSTRUCTION/CODES COMMITTEE RELEASES NEW WHITE PAPER ON CONTROLLED ATMOSPHERE FIRE PROTECTION

The IACSC-IARW Construction/Codes Committee released a new white paper, "Controlled Atmosphere Fire Protection" to help members better understand hypoxic air fire protection systems. Global Cold Chain Alliance members can download the white paper by going to www.gcca.org and searching for the keyword "Hypoxic."

DON WIGINTON, CEO of Wiginton Fire Systems, is a co-author of the white paper on hypoxic fire protection.

facilities, where conveyors bring products through vestibules into truck docks, this concept appears to be more viable," he says.

Another issue that needs further study is the energy costs of running large nitrogen or hypoxic air generators to keep the oxygen content at the right level. "It is also important to constantly measure the gas content of the environment so it doesn't become a potential tinder box without any fire protection," explains Wiginton.

Employee Safety Concerns Disputed

Perhaps the most significant issue in the U.S. is the health of the people who work in the hypoxic environment, admits Wiginton. The inventor of this system contends that the dangers of exposure are not great, citing references to people who live in low-oxygen environments to improve wellness and athletic performance, but the Occupational Safety and Health Administration (OSHA) has a different opinion.

"The biggest barrier to widespread use in the U.S. is OSHA and its requirement for work environments to contain oxygen content at no less than 19.5 percent without the use of a self-contained breathing apparatus," says Wiginton.

OSHA contends that at oxygen concentrations between 19.5 percent and 16 percent, workers engaged in any form of exertion can rapidly develop hypoxemia as they fail to obtain the oxygen they need to function

properly. "This is ironic because the inventor originally developed the environment to enhance the health of athletes and mountaineers," says Wiginton.

Another barrier is national building codes and typical requirements that buildings of a certain size and hazard classification be equipped with fire sprinkler systems designed and installed in accordance to the National Fire Protection Association Standards.

Within the NFPA standard that applies to PRWs is a statement that allows for installation of an alternative fire prevention system if the level of safety prescribed by the standard is not lowered. Wiginton points out that this statement refers to new fire sprinkler technology and does not address other forms of fire protection.

"Even if the standards may allow new technology, an owner needs to check with the insurance company," advises Wiginton. "In speaking to our friends at Factory Mutual, one of the premier industrial insurers in America, there is not a high degree of confidence in the hypoxic air concept and they tend to rely on fire sprinkler systems."

There are other fire suppression systems that are not water-based, says Wiginton. "These other systems are typically employed in computer rooms, museums and other environments where water is not an option and they systems employ chemical agents that ultimately reduce the oxygen content," he says. "However, they are very expensive compared

to fire sprinkler systems and are only viable for small, airtight occupancies and for those where price is not an object."

The logical next step for research is further evaluation of the system's use in European warehouses, says Wiginton. "We need to talk with building officials and owners, and see the process in action." He sees this as an ongoing effort to evaluate cutting-edge technology.

Questions related to hypoxic fire protection systems in cold storage warehouses will begin to be answered when the first U.S. installations begin. "I believe my Massachusetts project is an ideal first installation," says Elicker.

Although the project is currently on hold due to other issues the owner is handling, the owner plans to move forward with a plan to use a hypoxic air fire prevention system. "We have historical data from European installations as well as other information to demonstrate the safety and effectiveness of the system," says Elicker.

Even with the current barriers, Elicker sees hypoxic fire protection as a viable option for cold storage warehouse owners in the future. "There will be one in the U.S., I just don't know exactly where and when." ☎

SHERYL S. JACKSON is a freelance writer based in Alpharetta, Georgia, USA who specializes in industry issues and trends.

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Empty racks in the new freezer space (-10 deg F) at Bahamas Food Services. Stellar extended the new the freezer by removing existing walls at the end.

— MEETING — COLD STORAGE DESIGN NEEDS

There are many complex considerations for designing cold storage warehouses.

By Mike Netting

In cold storage construction, one size does not fit all. There are numerous variables that must be considered, requiring thorough attention to detail and an ability to analyze and identify the most cost-efficient, optimal solutions to meet specific needs.

At its core, a cold storage facility is designed around the type of product to be stored and how long it will be stored. But as technologies and techniques aimed at improving efficiencies have proliferated, cold storage warehouses have become complex environments.

Today's cold storage designer must contemplate numerous factors such as energy efficiency, automated processes, new materials, higher volumes and throughputs, diverse SKU counts, increased life safety and insurance company restrictions, and more.

Inside the Building

The most important consideration when designing any cold storage building is how the facility will function to meet the owners' specific needs. At Stellar, we begin all work with an industrial engineering study, designing the building from the inside out. For example:

- What is the product mix (SKU count, churn rate and density)?
- How will it be packaged?
- How many cartons on a pallet?
- How high will be the pallets be stacked? How much will they weigh?
- How flammable is the material being stored?
- Will the material handling be automated or manual?
- What will the throughput (amount of items moving in and out of the facility) be?
- Will there be full-pallet picking or piece-picking operations?
- What are the best layout and slotting options?

The Structure

Conventional refrigerated warehouses are constructed of standard structural or pre-

engineered steel frame, which forms the building. Then the wall panels, roof deck and roof insulation, and membrane are attached to the frame to form the building's thermal envelope. Inside, the standard pallet rack is erected on an independent floor slab and does not interface with the building steel.

Other building considerations include:

- Under-floor heat and insulation
- Building maintenance and worker amenities
- Maintenance shops
- Dock, doors and levelers

- Parts stores
- Offices
- Pallet storage and repair
- Fork truck parking and charging locations
- Packaging, stacking, palletizing and wrapping machinery locations

Energy Efficiency

With monthly energy costs for cold storage facilities running in the hundreds of thousands of dollars, energy efficiency design considerations are an extremely high priority. In addition to refrigeration, automation and thermal considerations—which I will cover in detail below—other factors that can influence the energy efficiency of the facility include:

- Under-floor heating systems.
- Consideration of adjacent room temperatures.
- Lighting—LED lights are becoming more and more popular.
- The orientation of building. Higher temperature rooms should be located at the southern end of the facility, and lower-temperature rooms at the northern end.
- Machine and electrical room locations to account for optimal utility distribution.

The new electrical room at Bahamas Food Services includes a switchgear lineup in front and large compressor VFDs in the rear (right side) MCC sections on the left (more motors).



Refrigeration

On average, the energy consumption of a typical refrigerated warehouse is comprised of:

- Refrigeration: 70—75%
- Battery charging: 15—20%
- Lighting and miscellaneous: 10%

Refrigeration systems can be custom designed to suit any specific operational need such as:

- Inbound product temperature load
- System redundancies
- Dock management
- Blast cells
- Penthouse construction vs. ceiling-hung evaporators
- Noise abatement

Factors that can influence the efficiency of refrigeration systems include compressor, condenser, evaporator and air unit selection, variable frequency drives, and premium-efficiency motors. These factors must be carefully balanced with operational demands and return-on-investment criteria.

Refrigeration Controls

In addition to mechanical efficiencies, automation can greatly improve refrigeration efficiency.

Modern refrigeration controls systems are truly impressive. They allow you to better manage your entire system, including optimizing energy use. You can generate trend analyses, alarm logs, energy management data, and runtime reports in real-time to make the necessary changes and modifications to ensure your refrigeration system is running at optimal efficiency.

Newer systems manage the control and sequencing of all equipment to maximize energy efficiency. They will respond to the demands of the system, sequence the entire process and ensure that the system is running at optimal efficiency. For example, the system will ensure that compressors, VFDs, and slide valves are running at the appropriate capacity; manage wet bulb condenser temperature requirements; manage refrigerant discharge pressure; and schedule the air unit defrost process.

All of these systems running appropriately will have great impact on energy efficiency and your bottom-line operations.

Thermal and Roofing

With the staggering energy demands of cold storage facilities, it's vital to construct a vapor barrier of uncompromising integrity. Numerous thermal details must be considered, including:



The machine room that Stellar designed at Bahamas Food Services refrigerated distribution center includes a liquid transfer unit and +35 degree intercooler vessel.

- A cost and return on investment analysis for varying insulation thicknesses. Factory Mutual structural requirements for insulated metal panels (IMP)
- Low-temperature door systems
- Options available specifically for cold storage construction, including fire-rated panels.

Code, Permitting and Insurance

Other factors that influence cold storage design are the local, state and federal code requirements. It's important to work with a designer who understands how these can impact the facility and will proactively coordinate with local officials early in the planning process.

It's also imperative to strictly adhere to Factory Mutual quality standards, with particular attention to:

- High-bay distribution operations
- Ammonia machine room requirements
- Roof uplift and attachment requirements
- Fire sprinkler systems

Fire Protection

With their ultra-dry environments and highly combustible insulation and packaging materials, cold storage facilities present significant fire risks. Thus it's imperative to consider all available fire protection types and systems for various product classifications, storage densities and code requirements.

For example, at a certain height, in-rack fire sprinkles are required by code, which drives

costs up significantly. Through careful analysis in the early planning stages, these costs can be avoided.

Electrical Utilities

Loss of power in a cold-storage facility can lead to significant financial losses. Therefore, design considerations for electrical utilities should include:

- Operating voltages
- Reliability of supply
- Standby generation
- Water for fire sprinkler system and/or booster pumps
- Machine and electrical room locations to account for optimal utility distribution

From the outside, cold storage facilities can appear to be large, simple boxes. However that perception is far from reality—they are complex environments requiring an advanced, detailed analysis in the design phase to achieve significant operational cost savings. ☞

MIKE NETTING is a Stellar Divisional Vice President, overseeing the company's work designing and building cold storage and food distribution facilities for companies such as United States Cold Storage, Burris Refrigerated Logistics, Food Lion, Sysco Food Service, and more.

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ASSOCIATION NEWS

NEWS ABOUT GCCA CORE PARTNERS

GCCA CEO Bill Hudson participated in a panel discussion on the role of the private sector in addressing postharvest loss during an educational event hosted by the U.S. Department of State. Held in February, the full-day event brought together U.S. government agencies, public and private sector partners, international organizations and representatives from developing countries to discuss challenges and strategies for addressing postharvest losses.



GCCA India Division Director Atul Khanna has been awarded a “Certificate of Appreciation for Achievement in Trade” by the U.S. Commercial Service, part of the U.S. Department of Commerce. The certificate was in recognition of his contribution to expanding U.S.-India trade. Khanna was presented with the certificate at a reception organized at the residence of Judy Reinke, the minister-counselor for Commercial Affairs for the U.S. Embassy in India. Khanna also recently met with Robert D. Hormats, Undersecretary of the United States, who visited the GCCA India



KHANNA

Division with a delegation of U.S. government representatives. Khanna spoke with Hormats about obstacles and opportunities in the Indian cold chain sector.



GCCA Regional Trainings are coming up in April in Dallas, Texas, USA, and Philadelphia, Pennsylvania, USA. These one-day, industry-specific workshops for PRW and logistics professionals offer more than nine hours of educational content delivered by leading experts in the industry. These training sessions are specifically designed for warehouse general managers and top-tier facility supervisors. The 2013 GCCA Regional Training schedule will dive into the topics of energy management and labor management from an operations perspective. The first Regional Trainings focus on Energy Management changes you can implement today with what you have, without costly investments. Learn more by visiting the Event Calendar at www.gcca.org



The **EUROPEAN COLD STORAGE AND LOGISTICS ASSOCIATION** (ECSLA) elected Luc Put of Colfridis Invest NV as President on January 1, 2013. He succeeds Hans van Leeuwen of Frigolanda Cold Logistics, who served as President for the past year. ECSLA is a **GCCA** Affiliate Partner.

2013 CALENDAR UPCOMING EVENTS

JUNE 2-4, 2013

2013 Food Logistics Forum Westin Lake Las Vegas Resort & Spa

Henderson, Nevada, USA
www.affi.org/events/2013-food-logistics-forum

JULY 27-30, 2013

GCCA Assembly of Committees Four Seasons Hotel

Washington, DC, USA
www.gcca.org

AUGUST 28-30, 2013

RWTA National Conference and Exhibition

Four Points by Sheraton Sydney, New South Wales, Australia
www.rwta.com.au

SEPTEMBER 12, 2013

2013 IARW North Atlantic Chapter Meeting

The Fairmont Royal York Toronto, Ontario, CA

OCTOBER 14-16, 2013

China (Shenzhen) International Logistics and Transportation Fair

Shenzhen Convention & Exhibitor Center Shenzhen, Guangdong, CN

OCTOBER 17-18, 2013

Latin America Cold Chain Congress: Mexico

Marquis Reforma Hotel Mexico City, MX

MEMBER NEWS

NEWS FROM MEMBERS OF GCCA CORE PARTNERS



A M KING completed the renovation and improvement of a rail dock belonging to Seaonus Cold Storage in Jacksonville, Florida, USA. The rail dock services Seaonus' major

off-port perishable facility. In other news, A M King Project Manager Ed Weeks successfully tested for and received his LEED AP designation. Ed is now the fifth person at A M King to hold this designation.



ACCELLOS has engaged in a technology partnership with Vitech Business Group, Inc. that will offer the Vocollect Voice solution to Accellos Warehouse Management System customers in the USA and Canada. The company also formed a partnership with West Monroe Partners, a full-service business and technology consultancy. The partnership enables Accellos to add West Monroe's proprietary FLEXdls labor management software solution to its existing suite of supply chain and workforce management tools. Accellos also released a new white paper, "ERP vs. Best-Of-Breed WMS." The white paper examines the decision factors from the varying viewpoints of the C-suite of a midsize company.



ADVANCE STORAGE PRODUCTS introduced its new 2 Wide DI, a double-wide drive-in rack system. This new product doubles productivity by allowing loading and unloading of two pallets at a time.



AMERICOLD appointed Fred Boehler as Executive Vice President and Chief Operating Officer. He is responsible for U.S. operations.



BALTIMORE AIRCOIL COMPANY introduced 57 new FXV models that provide selections up to three feet shorter in height than current models. These new models are being added to the FXV-0812, 0818, 1212

and 1218 unit sizes based on feedback for reduced-height solutions.



BITZER U.S., INC. was honored by Hall County, Georgia, USA with an "Industry of the Year Award" for its economic impact, corporate responsibility and growing workforce at the fourth annual Industry Appreciation Awards hosted by the Greater Hall County Chamber of Commerce.



ESI CONSTRUCTORS, INC. received the 2012 Platinum Award of Honor from the Associated Builders & Contractors of Wisconsin. This honorary acknowledgement was presented to qualified ABC Members to mark their Zero Lost Time & Zero Recordable Accident Records.



CASTLECOOL has been named one of Ireland's "Best Managed" companies in the Deloitte Best Managed Companies Awards Program for the fourth year in a row.



KRACK CORPORATION sold the assets of its Krack industrial business to SGS Refrigeration Inc. SGS will sell the products it is acquiring under a new SGS/Krack name in the industrial marketplace.



CONGEBEC LOGISTICS INC. acquired the assets of Westco MultiTemp Distribution Centres Inc., consisting of four temperature-controlled warehouses located in Manitoba, Saskatchewan and Alberta, Canada that have a total area of 610,000 square feet and include over 12 acres of prime land in Calgary available for future expansion.



COPAL DEVELOPMENT has developed a semi-automatic container unloading and palletizing machine.

CROWN EQUIPMENT CORPORATION announced that its Crown RM 6000 Series reach truck earned the prestigious GOOD DESIGN™ Award from The Chicago Athenaeum: Museum of Architecture and Design and The European Centre for Architecture Art Design and Urban Studies. This marks the third significant design award for the Crown RM 6000 and the 12th GOOD DESIGN™ Award for Crown Equipment.



DEMATIC introduced a set of warehouse solutions for high-density pallet storage. Each solution is engineered to support production and distribution operations that need an effective way to receive, store and ship full or mixed case pallet loads.



ESI GROUP was given the Associated Builders and Contractors of Wisconsin's Gold Award in the General Construction — Industrial (Over \$3 million) category at the 20th Annual Project of Distinction awards ceremony.



HANSON LOGISTICS promoted Jack White to Vice President and Chief Financial Officer. He will continue to be responsible for all aspects of accounting, risk management and

finance, as well as Hanson's 401(k) and pension plans. White joined Hanson Logistics in 2009, bringing a strong and diverse background as a strategic finance leader.



INTELLIRF SYSTEMS has introduced IRV (Infiltration Reduction Vestibules), a new product that reduces heat infiltration and resulting frost buildup by 50 percent. Ralcorp and Glanbia Foods are among the first customers, ordering over 200 IRVs for their cold storage units.

MEMBER NEWS

NEWS FROM MEMBERS OF GCCA CORE PARTNERS



Chuck Tippmann of **INTERSTATE WAREHOUSING** announced his retirement as President of Tippmann Group/Interstate Warehousing. He was an integral part

of the success and growth of the company over the past 30-plus years, including 21 years as President of the company. John Tippmann Jr. will assume the role of President of the Tippmann Group. John Jr. has been involved with Tippmann Group since age 20 when he started working as a warehouse supervisor.



LINEAGE LOGISTICS, a warehousing and logistics company sponsored by Bay Grove Capital LLC, acquired the assets of Seattle Cold Storage and its facilities in the Port of Tacoma and Algona, WA. The acquisition

increases Lineage's footprint to over 13 million square feet and 290 million cubic feet.



METL-SPAN released a comprehensive design guide for its recently-introduced HPCI Barrier™ insulated metal panel. The HPCI (High Performance Continuous Insulation) Barrier offers all the functions of air, water, thermal and vapor barriers plus thermal insulation and rigid sheathing in a single element.



MILLARD REFRIGERATED SERVICES expanded its distribution center in Attalla, Alabama, USA. The company said it decided to expand following the signing of a multiyear contract with a national food manufacturer.



REED BOARDALL GROUP has increased its cold store capacity at its 55-acre site in North Yorkshire, United Kingdom. Capacity increased from 110,000 to 142,000 pallets. A newly completed store building also adds 14 new loading docks, bringing the total to 54.

SMARTWATT ENERGY completed a lighting upgrade at the ConAgra Foods Lamb Weston/RDO processing plant in Park Rapids, Minnesota, USA that is expected to save the company \$174,966 per year in energy costs.



THE RAYMOND CORPORATION introduced iWAREHOUSE Essential™ and iWAREHOUSE Enterprise™ — two new solutions that combine fleet efficiency, warehouse optimization and professional services.



VICWEST acquired 56 percent of the common shares of All Weather Insulated Panels. ☞

NEW MEMBERS

NEW MEMBERS COMPANIES OF GCCA CORE PARTNERS

IARW WAREHOUSE

Cold Star Freight Systems, Inc.
Victoria, British Columbia, Canada

Partner Seafood Inc.
Shediac, New Brunswick, Canada

Advanced Storage of Baton Rouge
Baton Rouge, Louisiana, USA

Bolingbrook Cold Storage
Bolingbrook, Illinois, USA

Nebraska Cold Storage
Hastings, Nebraska, USA

IARW ASSOCIATES

Cold Chain, LLC
Boise, Idaho, USA

Cornerstone Builders Ltd.
Bellevue, Ontario, Canada

Kingspan North America
Caledon, Ontario, Canada

New Cold Storage Corp.
Toronto, Ontario, Canada

Honeywell (HSM)
Singapore

Kredit Obchodní společnost
Slavkov, Czech Republic

International Coil Limited
New Delhi, India

Mehta Frozen Food Carriers P LTD
Mumbai, India

White Knight Logistic
Gurgaon, Haryana, India

Saunders Construction, Inc.
Costa Mesa, California, USA

WFLO

Mehta Frozen Food Carriers P LTD
Mumbai, India

IRTA

Central Florida Freezer, Inc.
Leesburg, Florida, USA

Mehta Frozen Food Carriers P LTD
Mumbai, India

OMEC Projects Pvt. Ltd
Chennai, Tamilnadu, India

White Knight Logistic
Gurgaon, Haryana, India

IACSC

Holden Installations Ltd.
Cork, Ireland

Cold Clad Ltd.
Gloucestershire, United Kingdom

RGS Energy
San Rafael, California, USA

Saunders Construction, Inc.
Costa Mesa, California, USA

COOL PEOPLE

PROFILING INFLUENTIAL PEOPLE CONNECTED TO THE COLD CHAIN INDUSTRY



KELLY MALLEY
Director of Marketing
Food 3.0

Kelly Malley is the Director of Marketing leading Food 3.0, a corporate strategy dedicated to changing the negative perceptions of frozen food for Nestlé Prepared Foods and Nestlé Pizza. In this position she is responsible for establishing visionary goals, internal and external action plans for communications, renovation and innovation, and performance metrics. Here she offers her perspective on frozen food trends.

CF: (COLD FACTS) Can you describe Food 3.0, your strategy, and the biggest challenges you encounter?

KELLY MALLEY: Food 3.0 is our plan for showcasing the relevance of our frozen foods. We make good food, and then we freeze it – it's the same process you'd follow at home, if you had time to prepare a recipe from scratch, and had made enough for a second meal. That's what we're doing for our consumers, every day. It's that simple!

Our goal with project 3.0 is to focus first on the food, and then on the freezing. One of the largest challenges we face is the ill-conceived negative perception that food "processed" or prepared in a large kitchen is somehow of poor quality. That's not true. Our meals are made of quality ingredients, by people who care. Then we freeze them, for convenience.

Freezing is safe, it's well-trusted and works beautifully to ensure a delicious meal for the



Consumers continue to have high expectations. They want value and they've placed increased emphasis on sourcing; they want to know where their food comes from."

— KELLY MALLEY

future. And, keeping those foods properly frozen as they travel from our Nestlé kitchens to the grocer's freezer case all the way to the consumer's kitchen is a critical factor in ensuring a quality experience.

CF: What trends are you seeing in frozen food consumption?

KM: Consumers continue to have high expectations. They want value and they've placed increased emphasis on sourcing; they want to know where their food comes from.

CF: How has the frozen food sector changed in the long-term?

KM: Perhaps what's most important is what hasn't changed!

Sure, we have many varieties of frozen foods, in lots of different packaging formats. But the natural method of preserving foods – freezing them quickly, to capture goodness and nutrition at the peak of perfection – is what hasn't changed. It's natural, and it works beautifully.

CF: How do you and your company address negative perceptions around frozen food?

KM: We have many efforts underway to erase the negatives unfairly associated with frozen foods. For example, we're doing more to show and tell our story of how our frozen foods are made.

Every day, we make fresh pasta for our lasagnas. We brown ground beef, just as you would, and then simmer a seasoned tomato sauce for just the right amount of

time. Then our cooks layer those lasagna noodles by hand, adding the other ingredients, following our delicious and nutritious recipe – just as we've done since 1954.

We're sharing that information directly with our consumers through our advertising and a variety of branded communication efforts (on package, web, Facebook). And retailers and other manufacturers have come together behind industry and category promotions, all focused on demonstrating the virtues of frozen!

We've also found it helpful to compare our recipes and their nutrition facts to similar recipes made at home. They are just as good, sometimes better – and ours are more convenient as well!

CF: How have food safety incidents impacted your messaging and business?

KM: The quality and safety of our products are non-negotiable priorities for our company. Our foods comply with all local food safety standards and labeling regulations. ☞

JAMISON: INDEPENDENT THIRD-PARTY TEST LAB RESULTS

The HCR Door results are in: ***80% efficient*** in blocking air infiltration



The HCR calorimetric environmental test chamber at CTS Labs in Urbana, IL

HCR pioneered the air door market 37 years ago and now has over 4000 worldwide installations. Until recently there was no authoritative, independent third-party test lab data that documented the efficiency of the unique HCR air door. A three-month evaluation was recently completed, and those results are now available to the marketplace.

Creative Thermal Solutions (CTS) is a leading test lab for products in the HVAC and refrigeration industries. They test products that claim to offer increased energy efficiency, reduced energy consumption, and environmental sustainability. CTS labs recently conducted an extensive thermal performance analysis on HCR air doors. **The results verified that the HCR Model AC (Single Air Door) is 80% energy efficient* when stopping air infiltration and energy transfer between rooms with different temperatures.**

HCR Air Doors - Remove All Obstacles

HCR demonstrates the greatest energy efficiency for doorways with over 10% DOT (door-open time), and can represent considerable and even dramatic energy savings in the right application. In addition to energy savings, HCR significantly reduces moisture from entering the cold room, and prevents icing and condensation on floors, walls, and products. Reduced frosting of the refrigeration cooling coils will result in fewer defrost cycles.

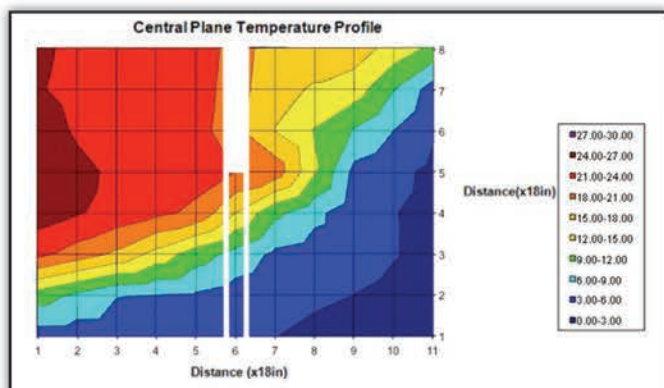
For more details about the CTS test results, visit www.hcrairdoors.com

JAMISON | HCR Air Doors

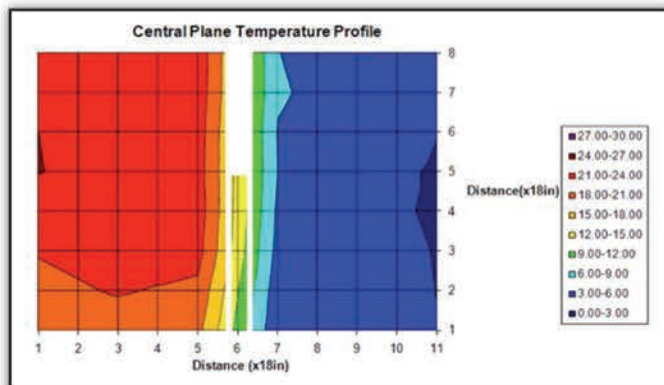
www.jamisondoor.com

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*For details and the lab performance report visit www.hcrairdoors.com, contact your Jamison or HCR representative, or call 800-326-7700. Request the White Paper on the Evaluation of Horizontal Recirculatory Air Curtain Efficiencies – Cooler to Conditioned Space, D. Rhyner, HCR, Inc.



Temp profile: air door off



Temp profile: air door on

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