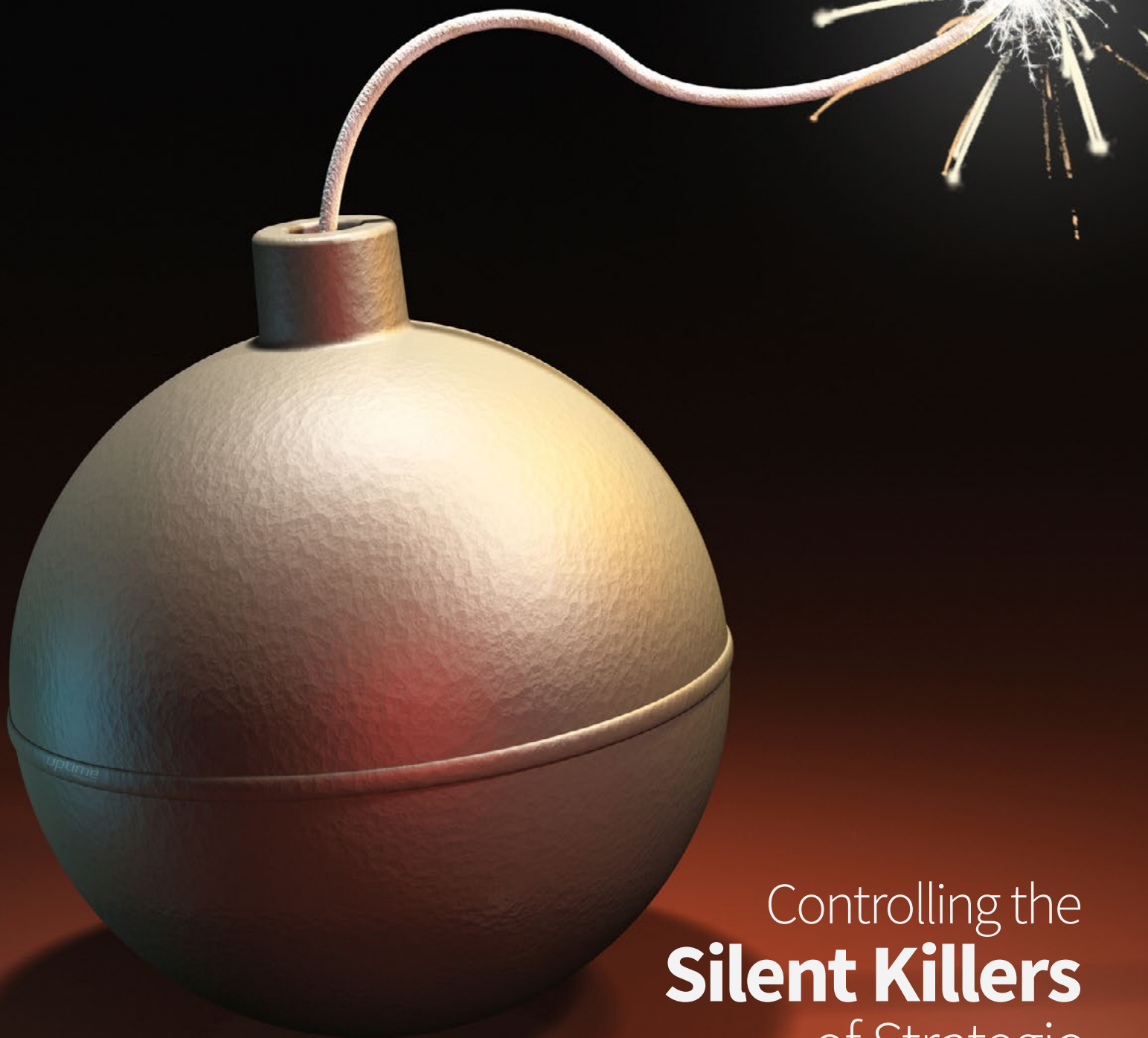
# uptime®

april/may 16

for maintenance reliability and asset management professionals



## Controlling the **Silent Killers** of Strategic Asset Management

uptimemagazine.com

Uptime Elements™
CRL Workshops


Create LEADERS in Your Organization

Reliability Leadership Institute I Fort Myers, Florida

# Certified Reliability Leader Workshops

*The industry's most advanced thinking in reliability*

**90%**
PASS RATE ON THE CRL EXAM AFTER TAKING THIS COURSE

## Included in your registration

**4-Day Workshop Pass**

**Uptime Elements Passport Series plus Travel Guide -** $150 value

**30 - day free trial to the Uptime Elements Academy Learning Management System -** $299 value

RELIABILITY WEB.COM

reliabilityleadership.com | 239.333.2500 | 888.575.1245 | crm@reliabilityweb.com

# Operational Analytics

## Help Lower Maintenance and Energy Costs

For some time, supermarkets have accepted that the costs for high customer volume, regulatory compliance and increasing energy rates were part of the business model. But the Danfoss Group, a Danish global producer of products and services used within infrastructure, food, energy and climate, has been providing a smart store solution for the past 10 years to help its customers across 5,000 stores worldwide optimize food safety and maximize energy efficiency. This solution also allows its customers to view their operations at a presentation level, create reports on alarms and performance, compare performance between stores, and reduce energy costs.

One of the Danfoss Group's main focus areas is within food retail, where it offers services in operational stability, food safety and energy savings around refrigeration systems. Specialized areas include cooling food, air conditioning, heating buildings, controlling electric motors, compressors and drives, and powering mobile machinery.

Within supermarkets, refrigeration consumes a significant and increasing amount of electricity, with the remaining from HVAC equipment, lighting and other utilities, such as in-house bakeries. These costs can escalate more quickly in warmer climates. Due to consumer safety concerns, food products are frequently stored below the required temperatures. This pursuit of improved quality and regulatory compliance results in higher than necessary refrigeration-related energy costs.

Central to the success of the smart store solution to keep food stored correctly and safely is how Danfoss helps their customers to continuously measure, monitor, analyze and implement the performance of their stores and the reliability of their equipment. Using Danfoss's own products, such as controllers, gateways and sensors, customers have access to store performance 24/7 via dashboards that provide them with insight into food control, temperatures, alarms, reports and much more.

There are many key solutions that enable Danfoss' customers to manage their supermarkets more efficiently and aid in their decision-making. Central to these is an alarm management system used to monitor food quality and energy efficiency, along with a visualization component to bring all the information together in one platform.

### Alarm Management System

An underlying alarm management system automatically raises alarms when thresholds for potential equipment failures have been reached. The difficulty with this process is identifying which alarms actually need attention and which result from programmed defrost cycles or refrigerator doors accidentally left open and can therefore be dismissed. Danfoss uses a software system to count repeated similar alarms, identify which are real and which are false, and notify the appropriate people. This leads to a more proactive approach to maintenance as opposed to reacting after an incident. Eliminating false

by Richard Irwin

"Using operational analytics, Danfoss achieves complete visibility of an entire operation"

alarms from the system significantly cuts costs by reducing needless callouts to maintenance engineers. Alarm histories can also be used against the asset, the fault, or the site to highlight patterns, such as determining why a particular alarm is occurring against the same asset consistently across multiple stores.

## HACCP Reporting

Danfoss addresses regulatory food compliance with hazard analysis and critical control points (HACCP) reports, a monitoring and reporting system that assures food production and storage facilities are safe. Using operational analytics software specifically for data collection, analysis and visualization, HACCP reports show the average temperature during an hour, typically in four, 15-minute intervals, of any asset containing food. These reports are displayed within dashboards so Danfoss and its customers can spot at a glance any differences in behavior in an asset's temperature by using color-coded boxes to indicate whether an asset is operating above or below its normal level. These reports can display historical data to prove that measures are taken to ensure food safety.

Coupled with a temperature quality index report, which displays the overall percentage for which an asset is performing within its set points, the reports bring a complete picture of asset performance in near to real time. This information enables maintenance teams to predict events and to take action prior to costly failures.

## Load Shedding and Set Point Management

Automated load shedding for demand response and set point management help facilitate automatic switching on/off of certain assets by interfacing directly with the hardware, including HVAC systems and store and parking lot lighting. From the dashboard, levels can be set to send a signal to certain controllers, such as lighting zones, turning them off over a set period of time. Each level of load shedding can include any number of assets, from a few to all. These measures help reduce energy consumption while encouraging financial incentives from the energy provider.

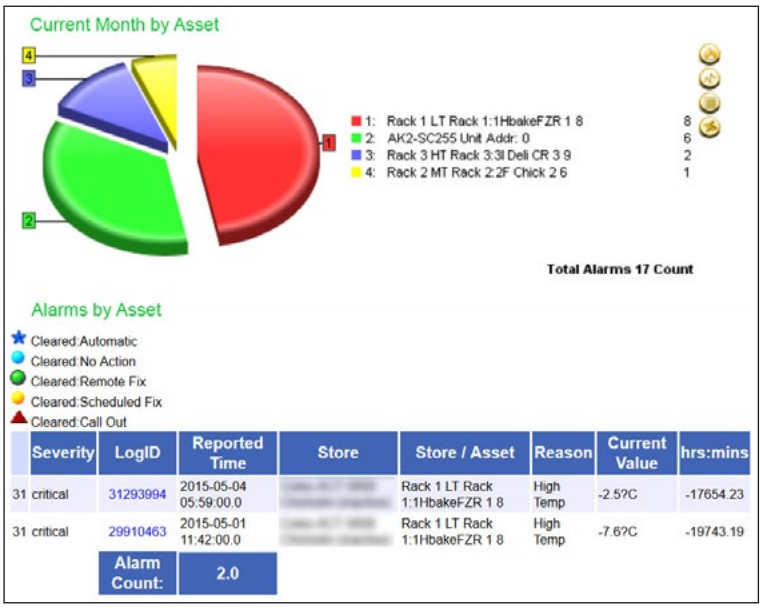
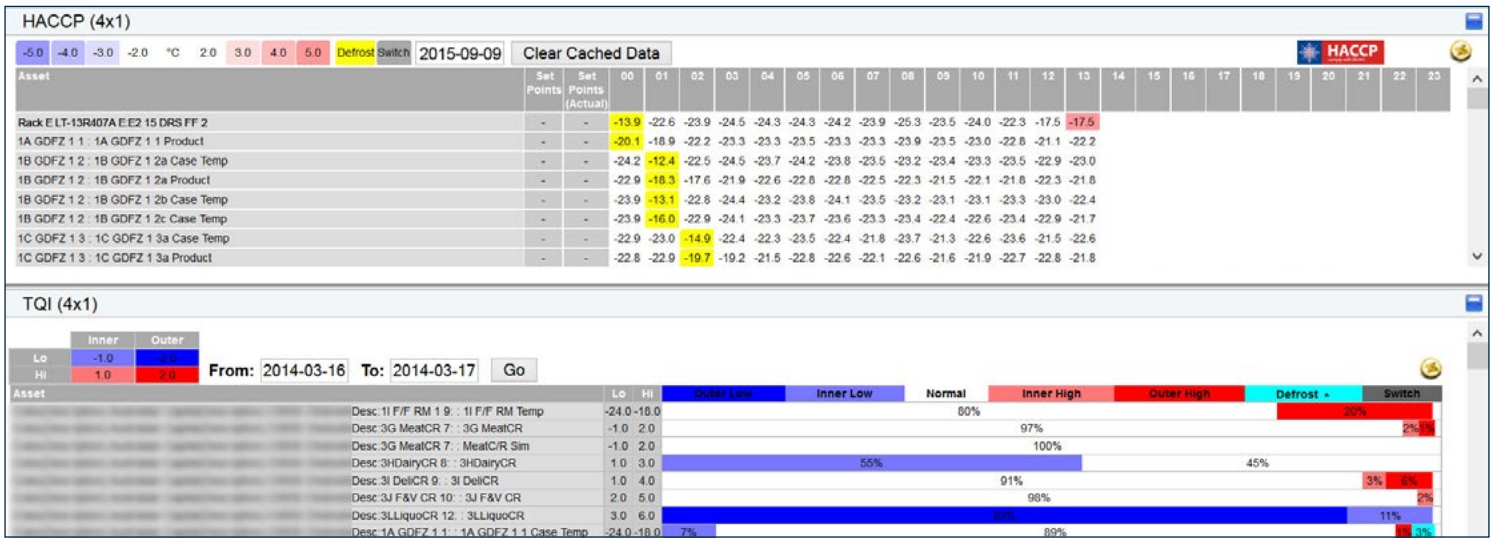



**Figure 1:** Alarm management system

**Figure 2:** HACCP reporting




Set point management automates corrections in hardware value points to ensure error control regulation of asset temperatures, switch status and alarm values. This means the software constantly checks values of specific hardware, like a switch or a set point, making sure they are correct. If a change occurs or is made accidently by a third party, it can be entered into an audit trail and automatically corrected to the original value. This ensures continuity to the operational performance of the store and peace of mind knowing that accidents will be avoided, further reducing callouts and loss of stock. Set points and schedules also can be changed for an entire location through one job.

## Results

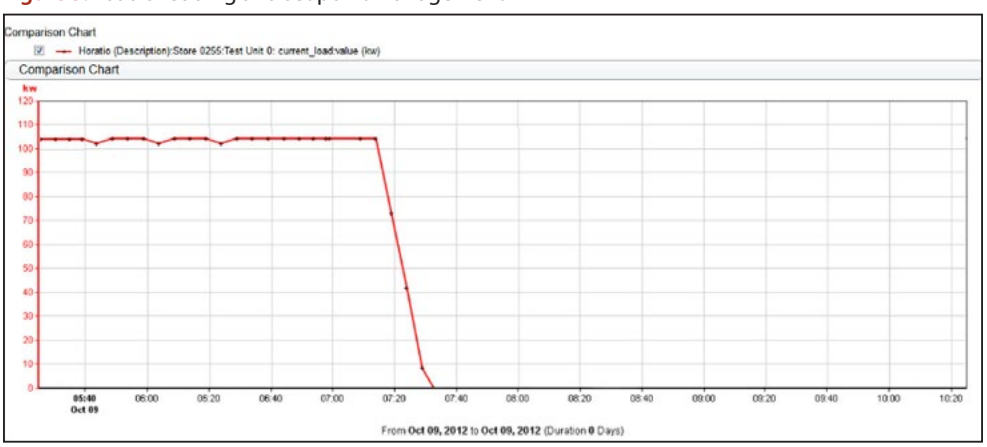
Using operational analytics, Danfoss achieves complete visibility of an entire operation, including energy usage against external parameters like outside/inside temperatures and other factors. By monitoring these patterns for its customers, Danfoss can regulate the environment in which the assets work. For example, refrigerators won't need to work as hard if the temperature or humidity in the store is controlled at an optimum level.

Through this alarm management system, Danfoss is able to determine that substantial energy savings can be achieved to affect its customers' bottom line. Key operational benefits include:

- Ensuring food safety and minimizing food loss
- Reducing energy consumption
- Anticipating failure of refrigeration equipment
- Filtering, identifying and notifying alerts and real service maintenance needs
- Prescriptive load shedding for optimal power reduction
- Prescriptive set point remapping when overriding settings

The alarm management system allows Danfoss's customers to monitor and track their assets and intervene when necessary if an asset triggers an alarm. With a variety of specialized alarms, such as threshold, percentage, or hold down, alarms can be filtered to only notify users of critical alarms, thus reducing false alarms and maintenance callouts.

**Figure 3:** Load shedding and set point management




## Summary

With its smart store solution, Danfoss ensures its customers are ready and fully prepared to meet the challenges within the food retail sector, including climate change, new demands on energy efficiency and concerns about food safety and standards. Technological trends also bring their own concerns, including harnessing the Internet of Things (IoT) and the challenges presented by the rise in big data.

Using load shedding, Danfoss continues to maximize energy efficiency in food retail to help customers reduce energy consumption, with the eventual long-term goal of achieving stores with net zero consumption or even stores that give more than they take in energy consumption. Asset reliability is essential in adhering to food safety standards and reducing food loss to a minimum, while unnecessary downtime is significantly lessened. With solutions from Danfoss that predict failures and trigger just-in-time maintenance alerts, achieving these goals is becoming a reality.

***Richard Irwin** is a Senior Marketing Manager for Bentley Systems' Operational Analytics platform, Amulet, with over 10 years experience in working within the analytics industry. Based in the United Kingdom, Richard holds a Master's degree in Sociology from Aberdeen University and a Master's in IT from Heriot Watt, Edinburgh. www.bentley.com*

# Online4US

ACM Asset Condition Management

## Online Ultrasound & Vibration Monitoring



- Stand-alone system
- Modular and flexible
- Up to 32 measurement channels
- Data & machine status posting
- Easy, user-friendly set-up
- 4 condition indicators

HEAR SDT MORE

Ultrasound Solutions

www.online4us.com