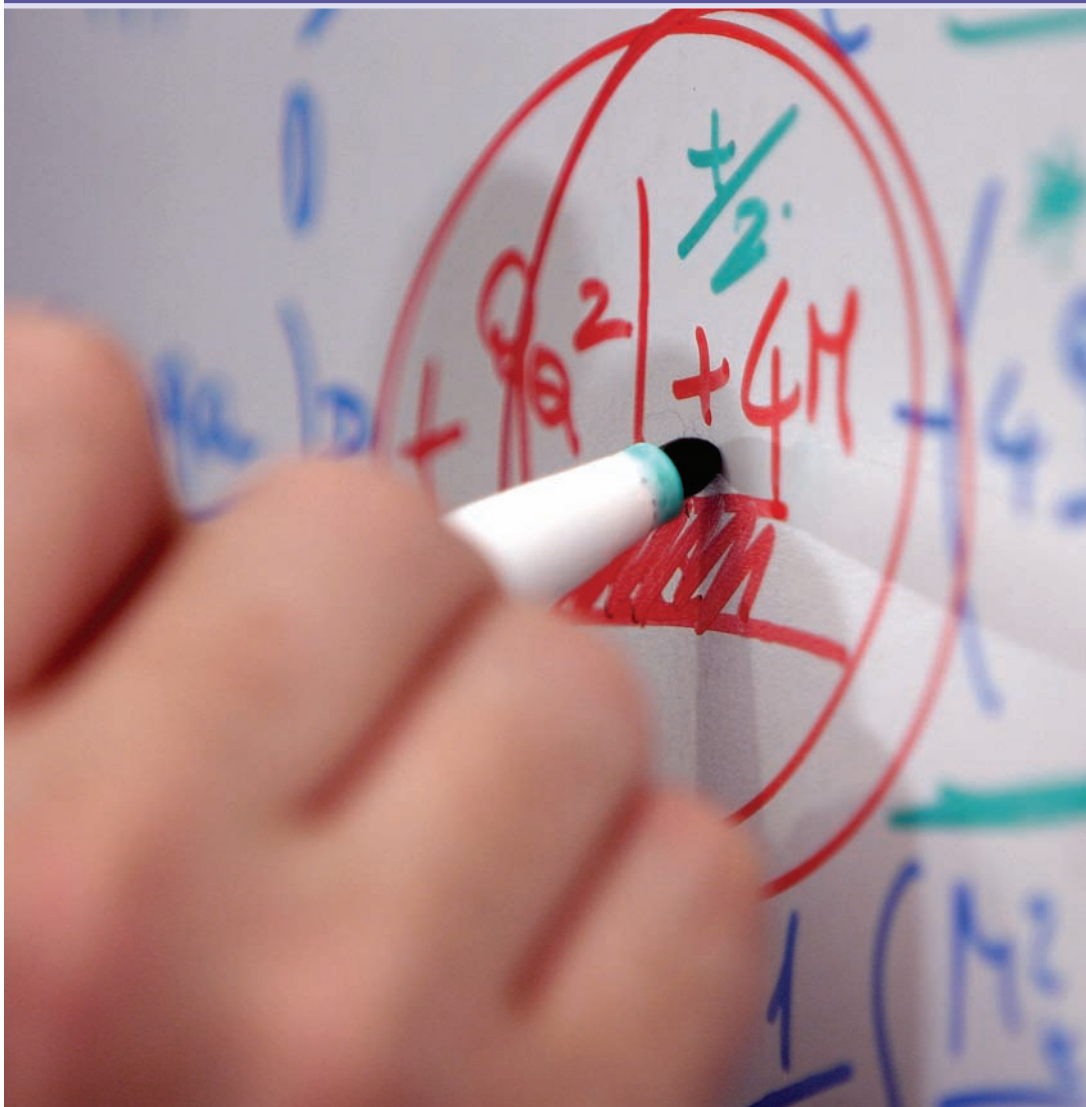


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PREDICTIVE ASSET MAINTENANCE
A *Utility Week* supplement in association with SAS



- **Looking into the future**
- **Smart meters**
- **The business opportunity**
- **Managing change**
- **Data mining**

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Reed Business Information

Predict and survive

Maintenance is at the heart of any utility, and doing it well is key not just to meeting financial targets but to meeting the expectations of customers as well. That requires a cautious approach, but one that is also alive to the possibility that there may be a better, more efficient way of doing things.

In the past, utilities had to rely on a standard maintenance schedule to keep their assets operating at their peak performance, although they may have suspected that was not the most efficient approach. Now utilities can act on that suspicion. They can collect – and make use of – data about the real condition of assets and their component parts, and they can organise maintenance assisted by that understanding via a predictive asset management system.

It's a powerful tool, and one that can create startling opportunities to improve efficiency, not least by allowing accurate predictions of exactly when maintenance can be performed most effectively.

In this supplement, produced in association with SAS, we look at the possibilities for predictive asset maintenance. We examine the potential savings and look at how companies can take a step-by-step approach. And we look at what that type of radical change can mean within an organisation.

Janet Wood

Editor, *Utility Week*

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The unique product range that SAS has tailor-made for the utilities market

The technology exists to allow utilities to accurately predict where and when assets will fail, allowing them to target maintenance budgets effectively

“Maintenance and inspection based on condition gives you more insight compared with primitive scheduled maintenance”

Utilities in both the electricity and water sectors have heard in the past month their final determinations from their respective regulators, Ofgem and Ofwat.

If spending plans have not been cut quite as close to the bone as utilities feared, they have at least forced water and electricity network companies to take a very hard look at their planning for the next five years. Companies will have to search for the efficiencies and innovation that their regulators and customers expect.

Of course, utilities are not alone in dealing with these issues. Any infrastructure provider has to manage a complex and capital-intensive system that is always on call to its users, and one where customers demand extremely high levels of service.

Road and rail providers grapple with similar issues. Speaking at Marketforce’s recent meeting on Infrastructure Asset Management, Steve Plumb, then head of asset management at Tube Lines, spoke about the difficulties of maintaining areas of London’s underground network where access might be limited to three hours at night when trains were not running. Nevertheless, he was able to point to areas where startling improvements had been made, simply by improving understanding of the assets.

Escalator refurbishment,



for example, in the past had taken an average of 26 weeks. However, Plumb said Tube Lines had changed to a component-based strategy in which a detailed understanding of how each component in the escalator aged was used to drive the maintenance process. The result was that maintenance shutdowns were cut to nine weeks, plus a reduction in failures that has reduced unplanned outages.

Graeme Thompson, finance and regulation director at Eon’s Central Networks, told a similar story. He says in a situation where funding is tight, and there are many calls on the company’s cash, it is vital to increase understanding of the asset base, and of the life cycle of the equipment within it.

Utilities have been going through a revolution in asset

management maintenance for many years, and practices have already changed beyond recognition. David Langford, client manager at analytics specialist SAS, summarises that change. He says: “In the utility asset management world we need to make a journey: from reactive to preventive, to predictive, to optimised maintenance.”

A change in mindset

So, how can utilities make that switch? First, it is about changing the mindset on maintenance. Instead of setting up a standard schedule on an asset, its owners need to understand why and where its performance will begin to deteriorate and set the maintenance schedule to match.

Second, it is about collecting data on assets on a continuing

basis. Sensor data can relay information on the asset’s performance to the operations centre on a daily or hourly basis – more frequently, if a change suggests that closer monitoring is necessary. That data can lead to relatively simple changes in the regular maintenance regime that will cut costs or increase reliability, for example by allowing intervals between services to be lengthened or shortened in response to hard data.

If used to its full extent it can revolutionise the process, meaning that maintenance can be determined not by what is next on a schedule set up when the asset was first installed, but by the real condition of equipment and an intimate knowledge of how its performance will degrade and when it will fail.

Alexander Daehne, head of SAS’s global supply chain practice, explains that the goal is to track the performance of equipment and generate early warning signals for faults.

He says: “Maintenance and inspection based on condition gives you more insight compared with primitive scheduled maintenance. It should result in higher availability and lower maintenance costs.”

The implications of switching to this type of strategy – sometimes known as condition-based maintenance (CBM) and sometimes as predictive asset maintenance (PAM) can be profound.

Daehne says: “A benchmark study published by the US Department of Energy as a best practice guide saw 25-30 per cent lower maintenance costs,

70-75 per cent improvement in breakdown elimination, 35-45 per cent reduction in downtime, and a 20-25 per cent increase in production.”

Step-change in performance

It is the type of innovation that means a step-change in performance, but it may also require new working practices and a re-education throughout the utility implementing it.

Langford says: “Lots of [utilities] are still at the reactive maintenance stage and they spend their time firefighting. They want to move up the value curve, to preventive maintenance and a more cost-efficient cycle.”

Some utilities are at the preventative stage and enjoy a “limited level of prediction – you can see the best maintenance schedule for a particular piece of equipment”.

However, he says: “Utilities really need to use historical data, like the time to fail, to predict which assets should be serviced or replaced because they are likely to fail in the next service period. Asset managers get excited by that, because previously they have done preventive maintenance. But now they need to use their people better and get their maintenance schedules more efficient, not do it one way because it has always been done that way.”

It is a new way of working, and one that could mean dramatic changes at a utility. But Daehne points out that PAM is not a replacement to existing systems but an enhancement, and one that can be added step by step. What is more, he believes that most utilities will find they already have data available that can allow them to cherry-pick projects that will repay this approach.

The goal is to track the performance of equipment and generate early warning signals for faults

From reaction to prediction

How to get fast wins from predictive asset maintenance



“Cherry-pick a project that can be approached with a limited data set”

Predictive asset maintenance should mean less risk, reduced downtime and improved revenue, enabling you to foresee problems before they develop into more serious and costly impacts on the business. But how can a complex business make sure that it makes the best use of such a powerful tool?

“Don’t try to boil the ocean.” That is the advice of Alexander Daehne, head of global supply chain at SAS, when he talks about moving from a reactive regime to one where you have visibility – even of invisible assets – and can manage maintenance and operation on a predictive basis.

He says most utilities will know their critical assets well. That might be the low-voltage substation with a number of customers connected and no alternative, or a critical

substation for a hospital. He says: “In those areas they will have built in extra contingency because they don’t have the information about what they cost.” The company does, however, know the cost of that additional redundancy, so it has something to measure against.

Once the critical areas are identified, it is time to find out what data is available. Here, Daehne says, companies are better off than they may imagine. “Not all companies collected historical data but there has been a shift in thinking. Most companies are already collecting data,” he says.

He points out that it may be quicker to collect data than companies imagine, even in areas where there is little or no failure history. He says: “If you don’t have many incidents, it can still be done. You don’t just want to model big failures. If you spot

something during inspection, like some corrosion, you would include it, and that happens relatively often. You can review the inspection frequency too, and you can include outside information such as weather patterns.”

Daehne advises: “Start very focused – but do have the big picture in mind. Cherry-pick a project that can be approached with a limited data set. When you have achieved the benefits on that project, you can fund further rollout and get buy-in from all the parties. You need some good stories to get user acceptance.”

That is exactly what has happened at three SAS customers, where the shift from reaction to prediction has brought the type of business benefits that quickly make the case for expanding the approach.

continued overleaf

WL Gore: from GORE-TEX fabric to guitar strings

Known to most people for “wearable weather protection”, GORE-TEX fabrics, W L Gore & Associates of Delaware is just as well-known and respected among high-tech companies for its high-end research and development of specially membranes, electronic technologies, and advanced medical devices. The company’s engineers and researchers rely on SAS to control its processes by providing intelligence about raw materials, temperatures, times, humidity and many other factors that affect production and yield volumes – for effective business results.

“SAS software is used throughout the manufacturing process,” says Dr José Ramírez, an industrial statistician at Gore. “Without SAS, we would find it difficult to successfully carry out many experiments and confidently report and act on our findings.”

Gore uses SAS to enable it to efficiently analyse mountains of important reliability data. And Gore has employed screening methods enabled by SAS to detect defect-prone devices early in the manufacturing process.

Gore deals with terabytes of data from many areas of its manufacturing facilities and uses SAS to turn all of that information into valuable intelligence. Equipped with this information, Gore engineers have been able to realise more

benefits, reducing production times, enhancing product quality and maximising yields.

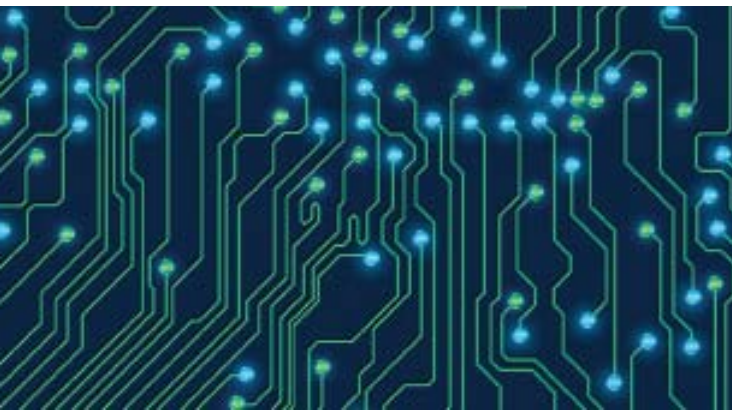
“SAS has been instrumental to Gore’s competitive advantage in the area of product reliability,” says Ramírez. “In one case, we increased the already exceptional reliability of a particular fibre optics technology by more than 70 per cent. We could not have reached that level of success without SAS and the collaborations with the SAS developers and technical support teams.”

SAS data mining powers the statistical modelling that Ramírez relies on to troubleshoot broad operations. He also relies on the SAS models to identify variations in output at specific points during the manufacturing process to fix or avoid production quality problems. The use of SAS for statistical process control, analytics and statistical modelling at Gore has led to the development of SAS applications in other creative ways across the organisation.

Ramírez concludes: “I know that I can depend on SAS not only for the reliability and flexibility of their software, but also for their hands-on approach to help me with my data gathering, advanced analysis and information delivery opportunities.”



“SAS has been instrumental to Gore’s competitive advantage in the area of product reliability”



Exacting and complex, the manufacturing process for semiconductors includes hundreds of sequential steps and countless opportunities for error. But with an automated production process and an engineering intelligence system that leverages information in near real time, IBM has built one of the most advanced, error-free chip fabrication factories, or “fabs”, in the world.

IBM’s factory in Fishkill, New York, produces some of the most advanced and powerful microchips in the world, used in the most compute-intensive and power-hungry businesses.

With a comprehensive combination of IBM DB2 data

IBM: the “fab” of the future

warehousing technologies and SAS Analytics software, engineers at the Fishkill 300mm wafer plant and a 200mm wafer fabrication plant in Burlington, Vermont, are able to access and understand every stage of the manufacturing process. Using SAS, they can apply diagnostic techniques that detect and address problems quickly and ultimately improve yields across every step of the fabrication process.

Data from all aspects of the manufacturing process are collected from each production and test location and consolidated in a central DB2 Universal Database. IBM engineers throughout the world use SAS to access and analyse the terabytes of data contained within the database.

“SAS has been a key component of our yield learning and engineering analysis programme for many years,” says John Balas, senior engineer for IBM’s Systems and Technology Group.

Balas leads a team of developers at IBM whose

primary goal is to empower engineers to capitalise on yield learning opportunities during development, as well as shorten problem detection and solution times in manufacturing. To meet these business objectives, Balas’s team designed a unique SAS application called DataView.

Balas credits DataView’s application of SAS with playing a key role in improving engineering analysis activities across the division, which has helped IBM retain an edge in a very competitive marketplace through the early detection of potential design and manufacturing issues.

In particular, SAS provides software developers with a toolkit of statistical methodologies that can be pieced together to form world-class applications. With analytic methods that are readily accessible through a procedure-based language, software development teams across IBM can concentrate on the engineering aspects of a project, rather than on fundamental coding tasks.

Briggs & Stratton: harnessing operational data

An SAS customer for nearly 20 years, Briggs & Stratton, the world’s largest manufacturer of air-cooled petrol engines, has a long history of using SAS to transform operational data into strategic intelligence.

The two companies’ collaboration swung into high gear in 1998 to resolve a data upgrade issue.

“Even though we have disparate pieces of software that actually operate the business, including SAP R/3 and Oracle, we use SAS for our business intelligence endeavours,” says Grant Felsing, the company’s decision support manager.

The IT department began building its data warehousing infrastructure in 1988. By 1995, SAS software supported

15 extract engines and more than 4,000 reports. In 1998, Briggs & Stratton invested in SAP R/3, but the new ERP system essentially wiped out its entire reporting infrastructure.

While SAP R/3 updated the company’s operational environment and removed the bulk of its legacy systems, it also removed most of the sources for the company’s advanced data warehouse. The legacy systems had contained not only the data management component but also the accumulated programming layers unique to Briggs & Stratton. Because the company relied on daily access to this information, it had to quickly reacquire all of its business intelligence.

“SAS really stepped up to the plate

for us to resolve the situation,” says Felsing. “We moved from a legacy mainframe environment to Unix-based servers, and SAS added the insight and business reporting we needed on top of SAP R/3 to make the system complete.”

Using SAS, the team created an executive management system that presents high-level business intelligence in a scorecard format. The system allows executives to select and modify reports, so they can quickly recognise when an unusual or unexpected event has occurred. Operational managers use a similar decision support application that provides a range of metrics for major product lines.

With maintenance strategies moving from “reactive and preventive” to “proactive and predictive” – in the face of critical business issues ranging from operational performance and cost pressures to industry regulation and environmental concerns – utilities are looking for ways to further optimise the planning, procurement and maintenance of all of their assets.

According to David Langford, head of utilities at SAS UK, the optimum approach to predictive asset maintenance (PAM) is founded on two pillars: the ability to handle huge data volumes, and the provision of sophisticated analytics to transform data into actionable (and more profitable) business and operational insights. Such a framework, he says, enables you to improve uptime and utilisation while reducing unscheduled maintenance, so containing costs and minimising business disruption.

“In one case, a major oil and gas producer used SAS to cut unplanned downtime by 80 per cent and reduce operating costs by 5 per cent,” he says.

Comparing “what-if?” infrastructure scenarios, for example, means you can balance the performance we demand of often ageing assets with other important drivers such as reliability, costs and customer satisfaction. At the same time, techniques like data mining can be used to generate alerts as part of early warning systems to identify issues before they can have a serious impact.

Langford says: “With the right solution in place, it shouldn’t matter whether the asset is an element of your infrastructure or a critical piece of production equipment – and utilities have both in spades.



Predictive asset maintenance thrives on good quality data, so the imminent arrival of smart meters is good news for those charged with maintaining the network

The reality today is that huge pressures, including increased energy and fuel costs and regulatory compliance, plus the general drive to not only keep assets running but to also do so at optimal performance levels, mean PAM is now a business essential.

“When it comes to addressing this environment, SAS is unique in that it is the only solution that enables you to both handle the large data volumes generated by vast quantities of assets and to also deploy industry-leading analytics and predictive tools to transform that data into valuable insights.”

Langford says that when smart metering is rolled out, this dual capability will truly come to the fore, as the additional data streams (and related opportunities for improved

maintenance) will be massive and continuous. “New data from smart meters, and the assets surrounding them, will mean even more opportunities to see, in real time, how your essential equipment, devices and plant are running, from single buildings to multiple sites, and across your infrastructure. SAS analytics for smart metering can feed direct into your wider asset maintenance platform.”

The opportunity, therefore, is even greater clarity and focus in predictive asset maintenance – to further improve efficiency, meet operational demands, reduce downtime and drive down costs.

As Langford says: “The most effective predictive asset maintenance solutions have an insatiable appetite for data, and smart metering will help to satisfy that appetite in new ways.”

“SAS analytics for smart metering can feed direct into your wider asset maintenance platform”

Predictive analytics can deliver enormous benefits, but any sea change in working practices can be disorienting for staff and has to be handled properly

"If staff on the ground don't understand the reasons why you're introducing big changes, you're doomed to failure"

Making change happen in the workplace can be tough. New work practices are a common cause of staff anxiety, reorganisation can give rise to rumours about redundancies and long-standing employees may be reluctant to change their ways. For utility companies there's an additional challenge: having large numbers of staff working in remote areas means the usual methods of transforming working practices – the global email or the meeting at head office – are not enough to realise change.

However, it is vital for those at the sharp end of change to buy in to it, says Chris Gauld, sector manager for Scottish Water. "If staff on the ground don't understand the reasons why you're introducing big changes in work cultures and behaviours, you're doomed to failure," he says.

For Scottish Water, getting that buy-in was crucial when the supply of water to business customers was opened up to retail competition. Business Stream was formed as an independent retail operation in advance of the new licensing regime launch date of 1 April 2008.

Preparations for change were made a year in advance of this deadline, recalls Julia Stevenson, head of organisational change and development for Scottish Water. "You need to start planning as early as possible to build in enough time to make sure those affected by developments feel they have real ownership of change, rather than that change is being 'done' to them," Stevenson advises.

The business ran focus groups with staff a year before the Scottish water market opened up to see whether they thought competition would be in the interest of customers and

to talk about what the changes might be. "This approach highlighted where there were gaps in knowledge, which helped us to pitch our messages to staff at the right level," says Stevenson.

These messages were pitched to 1,100 staff via email, the staff newspaper and posters. To ensure a more in-depth understanding of the changes, Scottish Water rolled out awareness training roadshows across the country. But it was training the company's 700-plus field staff that represented the biggest challenge, "so we made a big commitment to doing face-to-face training", says Jessie McLeman, head of wholesale services for Scottish Water.

Business separation

While the physical aspects of their roles would stay the same, business separation meant staff who had historically dealt with corporate customers would now be obliged to only inform them of basic information, because it was important for Scottish Water to be seen as independent of any licensed provider. This was a big change for field staff who had been doing a job since their teens and were now in their 60s.

"Many couldn't see how this business separation would be better for the customer, so we impressed upon them the code of conduct that we are legally bound to, stressed the importance of protecting Scottish Water's reputation and emphasised the positive aspects of change," says Stevenson.

Helping to pass on these ideas as well as dealing with employee concerns were the company's "compliance champions" – staff who, on top of their existing roles, would go out to different parts of the business to spread the word about new ways of working.



Change happens

Pocket brochures reminding people of the dos and don'ts of the new ways of working were issued to staff, and a DVD made for Scottish Water showing actors depicting scenarios and dilemmas employees might face was shown in sites across the country.

To test how much staff had understood about the business separation, Scottish Water conducted a phone quiz with a sample of those who had gone through training and found there was around an 80 per cent recall from those sessions. The quiz was also used to identify gaps in knowledge about the changes, which were tackled in follow-up training sessions.

The change programme taught Scottish Water some valuable lessons, McLeman says. "We learned that you need to be crystal clear about the messages you are giving staff about what they are being asked to do to avoid any ambiguity," she says.

Wales & West Utilities

Wales & West Utilities also recognises the value of meeting staff to tell them about new

developments. When the company launched a £300 million Alliance in April 2008, to deliver its entire 2,100km of mains replacement programme, the change required more than the usual "email communication route", according to the company's Alliance general manager, Rob Long.

"Emails can be interpreted in the wrong way and don't provide people who support the business with any means to feedback in to the change process," Long says. "So from the start we went out in the field, talking to people about what the changes would mean for them."

In its first few weeks, the Alliance – which is made up of Wales & West Utilities, Amec and Morrison Utility Services – mapped out its five-year strategy, sharing and engaging with its 650 employees and industrial staff. An Alliance leadership team made up of senior staff across the three organisations was created, and part of their role was to communicate to staff how the changes would affect them.

"When it came to

communicating change, we had one rule – that as soon as we made a decision that was likely to affect people we would let them know," says Long.

Talking it over

Initially, staff attended meetings held by the leadership team to receive "top-down" information about the aims and benefits of the Alliance, "but we soon realised that we were receiving useful information from staff about how we could improve things and felt it was important to encourage and do something with this feedback", recalls Long.

The Alliance runs monthly roundtable meetings where the leadership team visits one of the organisation's seven depots to get staff input.

"We start the meetings with a business update, but this is mainly done to kick off a conversation about how things are going – then we sit back and let staff talk," explains Long. To encourage operational staff to discuss issues freely, the business also holds monthly breakfast meetings without bosses being present.

At first, typical questions to the team would be about pay rises and holidays, but by ensuring these meetings were an open and honest forum for staff to discuss issues, they have resulted in some "informative debates", says Long. "Staff input about how we can do things better, save money and improve customer satisfaction has helped shape the Alliance," he says.

To reassure staff about the changes, the company published details of what the five-year programme of works would entail. "Letting people know our plans gave everyone a sense that 'Yes, there is a job to do and it's not going to change for a while'," says Long.

By matching employees' skills and experience to the new roles required by the Alliance the business was able to make the most of their talents. However, some were reluctant to work under the new regime, and when job cuts were required, a few – mainly long-serving – employees took voluntary redundancy.

Most were "ready for change", says Long, as shown by the low rate of staff turnover since the Alliance began and by the organisation's employee survey this year, where 95 per cent said they supported its key objectives.

Making sure staff in all parts of a business have the chance to meet managers to discuss fears and give feedback is essential to making any change programme work, Long believes.

"When you communicate with a person, they should be able to communicate back. If you have someone working in a remote area without a computer, that blocks their ability to provide you with an opinion. So the only way of making sure they can do that is to get out there and talk to them."

"From the start we went out in the field, talking to people about what the changes would mean for them"

What do you know?

Even apparently chaotic data can be mined, sometimes with surprising results

Sub Zero: a cool solution

In an industry where product defects can take, on average, six months to a year to identify and address, the Sub-Zero Freezer Company, which produces high-end refrigerators and wine storage units, and its corporate companion Wolf Appliance Company are using SAS software to cut those times in half.

A typical warranty claim includes customer requests, service notes and technical jargon, plus contact information, parts numbers, dates and time fields. Sub-Zero and Wolf know this data is a gold mine for improving product quality and customer satisfaction. But too often the process of coding and classifying that data and then sifting through it to identify trends can slow down the product improvement process.

David Bien, corporate director of reliability, says: "With SAS, we can be more proactive. We can keep an eye on a specific series of events, and the system will automatically send e-mail notifications if, statistically, even the most minute issue might have occurred."

Before using SAS, Sub-Zero employed two full-time data entry specialists to manually enter warranty claims data into a database for reporting. Although effective, the process of grouping problems and complaints into more than 200 categories could be slow and was open to human interpretation.

Now, SAS Text Miner automatically parses the text-based warranty claims data, distills key concepts and analyses relationships between claims. This process groups warranty claims into the correct categories and restructures the information for use in data exploration, clustering and statistical modelling.

SAS Warranty Analysis software then combines the restructured warranty claims data with other data into one database for tracking and reporting. SAS also produces a scorecard providing an at-a-glance overview of current issues.

According to Bien, the predictive analytics in SAS can detect emerging issues and pinpoint where they occur three months sooner than Sub-Zero's previous system. Josh Becker, manager of reliability, predicts a full return on investment from SAS within 14 months and a 50 per cent reduction in warranty claims within the next year.

"With SAS, we can be more proactive. We can keep an eye on a specific series of events"

How much data is available on your processes and assets?

SAS head of global supply chain Alexander Daehne says companies can be surprised by being able to find gold in datasets thought not to be useful. The key is the ability to take on data that does not fit neatly into the obvious fields.

Text records are a good example. Operatives may not have recorded information in

a systematic way, so it appears that it is impossible to learn systematic lessons. But SAS text analysis looks for key words and patterns within very variable text records. Finding a regular mention of failures in a small item like a switch, outside the regular maintenance activity, can point to a small but repeating problem.

Similarly, linking the analysis to geographical information and external factors such as weather

can make previously obscure problems clear.

That ability to make use of disparate information streams means it can produce some surprising results.

Take a different look at a regular problem with equipment breakdown. The problem may not be with the equipment. Daehne asks: "What's causing the effect – is it mishandling? If so, that's hard to predict. You must increase visibility

so you can analyse the events. If breakdowns always happen on a Monday night shift, you might ask whether the operative is recovering from the weekend."

It also means that the ability to use the system is not restricted to hard engineering data. It can take in and use opinion as well – extending even to such apparently personal issues such as taste – and the benefits can be much wider.

"If breakdowns always happen on a Monday night shift, you might ask whether the operative is recovering from the weekend"

Kraft: how creamy? How crunchy?

Kraft's portfolio contains many of the world's favourite food brands. To ensure consistent flavour and appearance, Kraft tests its foods throughout the manufacturing process and assigns numerical measurements that quantify the flavour, colour, aroma and other attributes of each product.

Two new SAS applications at Kraft allow product developers and sensory technologists to evaluate recipe reformulations, product improvements and consumer preferences with credible assuredness. The first is a sensory

analysis application that analyses input from product taste tests. The second evaluates and compares production processes in order to reduce variation in baking and mixing, and to enable greater planning efficiencies throughout the manufacturing process.

"Our SAS applications encompass the full project life-cycle of product and sensory testing," says Beth Knapp, lead systems developer at Kraft. "From ingredient selection to questionnaire development, experimental design and top-line reporting, SAS software cranks

through all of the collected data and reports summary results."

At Kraft, terms such as chewy, sweet, crunchy and creamy are assigned precise definitions and numerical scales so standardised product information can be entered into Seneca. Short for Sensory and Experimental Collection Application, Seneca has a database of information that includes everything you might be interested in, in terms of sensory tests.

With the help of SAS, Seneca takes the collected data from these tests and makes it available for analysis and reusability. The system

builds models, histories and trends based on consumer testing, and evaluates product changes based on discrimination and descriptive testing.

Since even small changes in the baking process can result in huge disparities in taste, Kraft employs SAS to ensure a consistent, reliable taste for each of its products.

"Reducing variation in production processes is valuable because it leads to greater throughput by reducing scrap and rework. Variation reduction also creates higher average quality," says Knapp. "Which means happier customers and more repeat sales."

"Our SAS applications encompass the full project life-cycle of product and sensory testing"

SAS in Utilities

According to a recently released IDC study, SAS is the “overwhelming leader” in advanced analytics

The IT sector is awash with software to help companies automate, execute, track and report on business transactions. But when these companies need to unlock the enormous value contained in their huge volumes of data, and use it to forecast, predict and optimise, they turn to SAS. Companies with these large, disparate data sources, such as banks, retailers, telcos and utilities, across all business functions, are using SAS Analytics to deliver proven measurable value, allowing them to make better decisions, faster.

The October 2009 Gartner Symposium placed SAS Analytics second only to Cloud Computing in its Top 10 Strategic Technologies for 2010. According to a recently released IDC study, SAS is the “overwhelming leader” in advanced analytics, being chosen more often than the combined 16 other analytics suppliers.

SAS solutions are designed to integrate with your existing infrastructure. And it's not just about a world-class technology solution, SAS combines a proven implementation methodology and industry leading education services to deliver faster implementation and lower development costs along with rapid, quantifiable ROI.

Having achieved operational efficiencies using transactional systems, and with reporting systems looking historically, the challenge now is to turn this data into mission-critical intelligence that can be used to forecast, predict and optimise.

With a proven track record of working with big energy and utility companies worldwide,

SAS solutions for the utilities industry are focused on:

Demand Forecasting and Energy Analytics

Only SAS provides the analytical flexibility to address a complex, changing market, accessing information at a far greater level of detail and from more data sources than other solutions. The net outcome is far greater forecast accuracy and thus security of supply.

Customer Insight

The proliferation of customer data across multiple channels and sources presents a huge opportunity to attract and retain the most profitable customers. SAS integrates data from all touch points to give a deep insight into customer attitudes, behaviour, profitability and risk. This insight is used to choreograph a comprehensive multi-channel communication strategy that optimises every resource, driving revenue and profitability.

Debt Management

Utilities must develop new approaches to dealing with debt to ensure that customers pay in a timely manner. SAS provides the ability to model the risk and value associated with all customers. From this, optimal plans can be devised to enable effective collection strategies while maintaining customer satisfaction and brand reputation.

Smart Metering Analytics

Smart metering is not just about energy consumption and more accurate billing. It

presents a once-in-a-generation opportunity to unlock the potential of new data streams to truly understand customers' energy usage and preferences. 2020 may be a long way off, but preparation for the roll out of smart meters has already begun. Pilot programmes can provide more than an operational test-bed for the rollout – for example, SAS Analytics can help select the optimal trial customers, point customers to their optimal tariff, better predict behaviour and thus future demand, and identify customers most likely to churn and manage them appropriately.

Predictive Asset Maintenance

Asset intensive companies need to move from a “fail and fix” to a “predict and prevent” environment. Using SAS Predictive Asset Maintenance, leveraging real-time critical asset operating information and risk and profitability analysis, utilities can focus on proactive maintenance, preventing equipment failures and significantly reducing maintenance costs.

Activity-Based Management and Cost-to-Serve

As customers become more demanding, utilities are using cost-to-serve analysis to improve their response. Using SAS Activity-Based Management tools, the profitability of products, customers and marketing channels can be measured at a granular level. This gives a fact-based focus for decision making – on service mix and operational changes – for each customer.

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