

Harmony all the way at Schneider Invensys, but focus is on Q4 figures before even 'that name' might change

In December we reported that “Harmony” was likely to be the Schneider and Invensys buzzword for 2014, and this was certainly the message repeated by the first post-merger interview held in January with Clemens Blum, executive vice-president of the Industry Business in Schneider Electric, and Mike Caliel, president of Invensys Industrial Automation and Software. While not quite the first question on the agenda, this executive line-up set the scene.

First, Mike Caliel remains as the man in charge of the major part of the automation businesses from the old Invensys, and is pleased to do so within Schneider.

Second, Clemens Blum, possibly a new name to some readers, is the Schneider man in charge of the three acquired Invensys divisions, and Blum advises that this is likely to be the case throughout calendar 2014. His objective is to integrate the businesses into the Schneider organization within this period. This is a considerable undertaking, since the branding has to change, marketing campaigns and sales strategies must be co-ordinated, the organizations have to be rationalized (surplus people let go) and the back end processes like manufacturing systems and ERP/Accounting systems combined.

The cultures match

Blum declares one significant advantage that is helping this integration task: having started on the work back in October, one of the first tasks was to engage McKinsey as consultants to look at the staff and management in both companies, in a “health index survey” – an assessment of mood and attitude to understand the

people profile and cultures involved. The report expressed genuine surprise from McKinsey – they had not seen before two companies facing an amalgamation where the cultures were so very much the same.



Clemens Blum:
“If we do it right, we have the capability to change the industrial landscape”

This was quoted as confirmed during a major internal get-together held recently for around 800 staff from across Schneider and Invensys, where there was a lot of excitement about the business opportunities apparent in moulding the two together, and the two camps together discovered they all had the same engineering technology mind-set. Harmony flowing everywhere.

Clemens Blum

Clemens Blum is a German trained electrical engineer, now aged 58. He joined Schneider when the Swiss company Positec Automation, where he had

progressed from sales director to general manager, was acquired by them in 2000. In 2009 he became svp in charge of global sales for the industry division. He approves of people taking responsibility and displaying entrepreneurship, dislikes bureaucracy.

In a 2011 interview at the ARC Forum, he stressed that industry represented 30% of global energy demand, and saw the Schneider position as providing the interoperability and transparency to link the two separate pillars of energy and production efficiency. Late in 2012 in an interview with Bill Lydon of *Automation.com* Blum quoted the example of performance contracting in water and waste plants, where the Schneider holistic approach and solutions led to lower operating costs, over and above the energy efficiency gains. [...this effect was also be quoted by ABB, see later in this newsletter, page 9].

TOPICS THIS MONTH:

Emerson opens new iOps center in Texas
Page 2

Helmuth Ludwig of Siemens, on US manufacturing
Page 4-5

CSIA 'Bullish' on the world economy
Page 5

Wired HART shown as vulnerable to hackers
Page 5-8

EDITORIAL
Page 7

ABB launches 'Authorized Value Provider' network
Page 8

Rockwell Q1 results
Page 10

Obama visits Vacon drives US plant!
Page 11

Insist Avtomatika of Russia wins US award
Page 11-12

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E+H advises 2013 results 'satisfactory'

The financial year for Endress + Hauser ends in December, and in 2012 the results were published in May (reported in *INSIDER* June 2013, page 6). At that time Klaus Endress said that "2012 was not an easy year", despite E+H sales increasing 11% and profit up 10%, after notably good results in the USA.

Now, for the 2013 results, Endress have already announced preliminary figures – although full results will only be published in May. CFO Dr Luc Schultheiss advises net sales were up 7% at just over Euro1.8Bn, and profits also showed an improvement. This was slightly below the target set a year ago by then CEO Klaus Endress - an ambitious 10% target for sales growth – but significantly employees in the base business increased by 553, above target.

A further 1300 employees joined the E+H Group through the major acquisitions during 2013: these new businesses also provided 2% of the total 7% sales growth. These included Kaiser Optical Systems in the USA, specialists in Raman spectroscopy, and the German laboratory analysis equipment specialist Analytik Jena, where E+H took over management control in September.

The current focus for the management is primarily on their customers. The main driver is that the business achieves the forecast financial outcomes for the final Invensys quarter up to March 31: so customer continuity and business continuity is the objective. "We have to keep the velocity up" explained Caliel. Part of this task is to communicate directly with executives in the main and strategic accounts, to explain the Schneider strategy and plans. Another important objective is that all the staff should have a positive, good experience over the acquisition period, and business continuity means there will be no major changes.

Schneider demonstrated this careful attitude over the acquisition share and cash options: initially the deal was criticized in the UK for this mix in the offer. In the January 2014 final reckoning, shareholders were given the choice for their payment options, as either in shares or in cash, confounding any previous critics. Blum was quick to point out that this showed how Schneider looked after their customers and relationships, in this case, their share-holders.

The value of the brands

Blum was quite definite about the high value placed by Schneider in the brand names acquired – Foxboro, Wonderware, SimSci-Esscor, Triconex, Eurotherm, plus other newly acquired names. "We are protecting the 'power names'," Caliel said. These are what the customers, and the employees, relate to – so they will be maintained, and reinforced. The Invensys name itself was not felt to have any major brand value, and would be dispensed with, fairly soon. When? It's not a burning issue, nor a priority, for anyone, but probably soon – by that it looks like the changeover will be finished in April/May, after the financial year end. Some Invensys executives are already sporting Schneider titles, for example, long-time Foxboro flow guru Wade Mattar reports that he is now Flow Marketing Manager...for Schneider Electric. The *INSIDER* asked Mike Caliel what his plans were. "I'd like to stay with Schneider and continue to do what I am doing," he said. *INSIDER* hopes he does.

The overview

The Schneider view, as expressed by Clemens Blum, of the acquisition, is that it is turning out positively, even maybe better than they had expected. They see the Invensys operations as opening up the process automation area to the group total product offerings, and providing a strong industrial software portfolio. The deal enhances and strengthens their energy management and efficiency management offering, and in the writer's view, bends the standard Schneider Electric strap-line of "The global specialist in energy management" towards efficiency management, maybe the words would be 'efficiency in integrating power and automation'.

But there was no gap, no difference of emphasis between Mike Caliel and Clemens Blum throughout the discussion, even though this report has concentrated on the input from Blum. In other words, harmony again. Their current combined view over the integration of the two companies is revealing – they are concentrating on the current continuity, but for the future, "If we do it right, we have the capability to change the industrial landscape". Looking at their report on the first months, they are starting by doing things right.

Emerson celebrates as the new iOps Center opens

With speeches from Texas Governor, Rick Perry, Michael Dell, the eponymous largest stockholder of Dell Computer, and David Farr, Chairman of Emerson Electric, plus Jim Nyquist, president of the systems business of Emerson Process, the local media and the automation press corps was introduced to the new Emerson Integrated Operations Center on January 30 and 31.

All three speakers focused on the Texas attitude toward business as the reason for the location of Emerson Process Management and the new Integrated Operations Center in Texas. Emerson calls the center their Innovation Center for Process Systems and Solutions, but the

heart of the addition is the integrated control room.



The iOps center and its associated training wing is located between the two “towers” of the Emerson HQ buildings and consists of the control room and a couple of conference or briefing rooms.

Operations in 4D locations

After speeches from Jim Nyquist, David Farr, Michael Dell and Rick Perry, Peter Zornio got down to brass tacks talking about iOps...integrated operations in 4D locations: Dull; Dirty; Dangerous; and Distant. Places like the Arctic, Papua New Guinea, and so on.

The processes themselves, Zornio noted, are becoming more complicated and difficult: fracking, FLNG, Syngas (gas to liquids), solar, steam injection, and so forth.

Then there are worker shortages, especially when you're trying to get people to go to the 4D locations to work, or deal with very inexperienced workers in those places.

Silos exist functionally that focus on their own objectives, but there are decisions that must be made that require de-siloing. Usually this means disjointed communication and decision making, between operations, 3rd parties, engineering and corporate that are geographically dispersed. You'd like to have all these silos cooperate in decision making, but it is very hard.

So we see companies moving all those functions into what we call an iOps Center. Using collaboration tools you can tap expertise, even from retirees.

The benefits are three: relocate, collaborate, align. This handles 4D, dissolves boundaries and gives a faster response to critical issues.

Relocation gives you reduced operating costs, concentrated expertise and improved access to talent. Collaboration gives you dissolved boundaries, faster and better decisions, physically or virtually. Alignment gives you increased awareness of shared metrics, shared goals, and faster response to decisions and strategic planning.

A practical example

Zornio gave a Formula 1 racing example, “based on the new racetrack just south of Austin” to show achieving operational excellence. Those racecars are amazingly instrumented, with roughly 300 sensors on them producing data on the car. They don't feed the data to the driver; they feed it to their iOps center. The ops crew (different from the pit crew) sits there monitoring, collaborating, and deciding in real time. Very much the same way it happens in a refinery, Zornio pointed out.

Zornio listed what he called the building blocks for iOps: reliable secure high bandwidth connections; wireless sensors and mobile worker infrastructure; collaboration tools. Another important building block he said, was pervasive sensing: real time data on the process and more - equipment health, safety, energy, security, environmental - remote eyes and ears.



The iOps Command Center

Emerson now offers a complete consulting service around designing and installing integrated operations centers for companies that need the help. Zornio pointed out that it isn't the supermajors who need this sort of service from Emerson, but rather the smaller companies who view it as a way to catch up to what the supermajors are already doing.

GE buys Cameron compressors

GE Oil & Gas has created a new division, the 'Downstream Technology Solutions' business, with the prime target of the expanding activity in shale oil and gas fields. As a major part of this business, GE has acquired the Cameron Reciprocating Compression Division for \$550m. This provides reciprocating compression equipment for oil and gas production, gas processing, gas distribution and independent power industries. Sales in 2012 were \$355m, employing 900 people across 20 global locations.

High-speed reciprocating compressors are used in several applications from gas gathering, gas lift and injection, as well as transmission and storage. The existing GE Oil & Gas High-Speed Reciprocating business focuses on low horsepower units that are used predominately in gas lift applications. The Cameron portfolio complements this GE business by adding higher horsepower models used in the gas gathering, processing and transmission.

Downstream Technology Solutions is intended to deliver products, services and packaged solutions for both the traditional downstream and the evolving unconventional oil and gas space, a market worth an estimated \$11Bn. GE Oil & Gas total sales are now approaching \$20Bn a year.

Economic indicators are turning up!

The year 2014 has started off with a positive mood and economic outlook in general, and in the UK in particular. Even looking at the *INSIDER* mailbox, the scene is much more healthy than 12 months ago, when the headline in our February issue exhorted people to "Wake up, it's a new year!" Perhaps on a more solid basis, Dr Nariman Behravesh, chief economist at IHS, comments that "According to IHS estimates, in 2014, emerging markets will contribute the least amount to global growth since 2010. Economies considered 'dull and old', like the USA, UK, Germany and Japan, will actually be 2014's new locomotives of growth."

However, Dr Behravesh cautioned that Europe's story was not all good news, noting that private-sector leverage, especially in the banking sector, remains at troublingly high levels. "We are seeing rising labour costs in the emerging world, stagnant wages in the developed world and low energy costs in North America. As a result, we will likely see a re-balancing of global investment flows back into 'dull and old' economies." Behravesh comments that there has been an alarming deceleration in the emerging world in the past four years, and a return to the BRIC party of the 2000s is unlikely. This maybe is bad news for the MINT countries.

4

Helmuth Ludwig of Siemens sees high growth in the US

A Profile by Joy Ward

Siemens' Dr Helmuth Ludwig pronounced his expectations for a wide-open future for United States Automation and Advanced Manufacturing, as well as for Siemens, in 2014 and beyond. Citing healthy economic indicators, cash-strong industrial balance sheets and promising innovations in manufacturing digitalization, Ludwig, ceo of Siemens' Industry Sector US, had nothing but good words for the US automation market in the next few coming years. "Talking about the economic recovery, we believe the recovery will continue in some of the key markets."



Dr Helmuth Ludwig

Ludwig made the statement that the US market will continue to digitize. "The manufacturing (sector) and the economy in general, is going digital especially in the US." The oil and gas sectors also hold promise for the US economy as the Siemens' leadership looks forward. "Significant investments are up in oil and gas," Ludwig said.

Mars Rover program

Digital manufacturing includes advanced process control, design simulation, process simulation and highly roboticized manufacturing with increased quality control and fewer, but more highly trained, workers.

Ludwig sees both technical and financial promise in the Mars Rover program, which used Siemens design software to produce the Rover Curiosity. He explained that the Rover program had no choice but to use digital simulation methods to plan landing strategies once the Rover reached Mars, because of the delay between the Earth and Mars for signal transmission. After all, how could landing plans be tested if not through digital methods? In this way, Ludwig said, the program itself served to move

virtualization and digital simulation forward in the broader automation market.

Ludwig was attending the North American International Auto Show (NAIAS) in Detroit on January 17th of this year when he shared his positive expectations of the US automation industry's groundbreaking gains. Ludwig gave his speech as the NAIAS celebrated the 100th anniversary of the assembly line, the technology that set the stage for the present automated manufacturing sector.

Ludwig supported his belief in a financially remunerative and innovatively exciting future with a wealth of positive signs. He started his recital of his expectation for the US economic recovery by citing a recent Goldman-Sachs study that indicated a 9% increase in 2014 capital spending. Ludwig also pointed out the

strength in the New Order Indicator, a measure he feels is probably the best indicator for the future. "(It) is at 86, a ten-year high of commercialized, developed production."

Ludwig noted that the Purchasing Managers' Indexes (PMI) have been stable in the last six months at around 55, indicating an expansion mode. He also pointed out that the Manufacturers Alliance for Productivity and Innovation (MAPI) index is 67, the highest since September of 2011.

Looking at the leading companies' cash-rich investment balance sheets, Ludwig sees another strong predictor. "We are seeing," he commented, "cash reserves that are on the balance sheets of companies that we haven't seen since the 1960s. There is approximately US\$1.7 billion on these sheets available for investment," Ludwig said.

Automotive and process developments

He expects more innovative collaboration among companies such as Comau, Ford and Siemens. He pointed out that these collaborations are averaging savings in the double digit percent range.

Siemens made a point of demonstrating how they plan to live up to this expectation with a demonstration of their collaboration with Ford and Comau. Siemens, with their Ford and Comau partners, took the opportunity at NAIAS to showcase their new wave of assembly line breakthroughs. The demonstration itself spot-lighted impressively innovative hardware and software technology using their combined manufacturing abilities. Siemens is no stranger to the automotive field. The company has a commanding presence in this market with Siemens' equipment in over 80% of automotive factories worldwide.

Although Ludwig's speech at the Auto Show was, coincidentally, aimed at the automotive market, Siemens' process industry presence is growing as well, with both organic and acquisition growth. Siemens has introduced, in response to the Stuxnet vulnerability, new field controllers (PACs and PLCs) that are designed from the circuit board up to be more secure than their previous product offerings. They have also introduced integrated engineering, design and operations portal software, allowing them to finally compete with Emerson's integrated operations and Schneider (Invensys) integrated software.

In all, Ludwig had the lucky job of sharing the good tidings of a good future for the US automation industry, with Siemens positioned to ride the wave.

CSIA is 'Bullish' on the manufacturing economy

CSIA, the Control System Integrators Association, is a 400-member-company professional organization, which has been able to create the entire discipline of control system engineering since its founding in 1994. Because it is an international organization, it has become an authority on manufacturing automation and integration that is in my opinion second to none.

Helmuth Ludwig of Siemens is not alone. CSIA also lines up with the bulls on the future of manufacturing, not just in the

US, but in most places in the world.

"We read about on-shoring. Manufacturing is coming back to the USA, work that had left some years ago, and automation is a big reason," Robert Lowe, executive director of the Control System Integrators Association (CSIA) said, in an article on *IndustryToday.com*. Lowe adds. "It's surely the best way to reduce operating costs to be competitive. Let's face it: Anything in manufacturing is of a competitive nature. I don't think anyone has a full niche on any market. That's why we're so bullish about automation in 2014."

Leo Rommel of *Industry Today* interviewed Lowe, and CSIA president, Piercarlo "PC" Romano. Lowe and Romano discussed an internal survey they'd conducted with the assistance of JP Morgan that showed average growth rates from 5% to 15% among integrators who responded to the survey.

"The markets that are showing the most activity and new orders right now are in food and beverage, oil and gas, and OEMs. We are certainly seeing an uptick in industrial equipment," Lowe added.

Romano was quoted as having said in a statement that CSIA integrator members expect the course of rebuilding and replacing older control systems to continue, thus matching Ludwig's comments on seeing "cash reserves that are on the balance sheets of companies that we haven't seen since the 1960s."

Wired HART is proved vulnerable to hackers!

After twenty years of assumed invulnerability, a security researcher has presented two papers on vulnerabilities in the venerable HART Communication Protocol.

First, in a presentation entitled "HART (in)security: how one transmitter can compromise whole plant," presented in November of 2013, and now at S4x14 in one titled "HART as an Attack Vector: from current loop to application layer," Alexander Bolshev, a security analyst at ERPScan, which is a security research firm devoted to SAP systems, has indicated

Gas detector user survey

City Technology has as their mantra "a single-minded commitment to improving the quality of gas detection through innovative technology". Acquired by Honeywell in 2006, City Technology was missed off the list of Honeywell's gas detector manufacturing companies quoted in the *INSIDER* earlier (June 2013, page 6): they claim to be the leading Honeywell brand for gas sensors, supplying 3 million sensors annually, including the Sensoric and Sixth Sense ranges.

Maybe because Honeywell has a series of different sources of gas detector, City Technology conducted a global survey to see the most important attribute users demand from their trusted safety suppliers. The survey quizzed 114 customers attending major trade shows late in 2013, at venues in Chicago USA, Düsseldorf Germany, and Shanghai China, to look for any regional variations.

Major agreement was found between all locations, with "Quality" being quoted most often (30% of respondents) and "Reliability" second (24%). However, in Europe, 26% mentioned "Innovation" as the most important attribute in assessing trusted safety suppliers. John Warburton, strategic marketing manager at City Technology said "These results are in line with what we at City Technology are experiencing".

Prosafe-RS SIS gets ISASecure certificate

Cyber crime and cyber warfare are on the rise worldwide, and are growing ever more sophisticated. Recent prominent cases of industrial sabotage and espionage have escalated these concerns.

Companies in the oil, petrochemical, power, and other industries are increasingly vigilant about such intrusions, and are being careful to check a product's cyber security features before purchasing it. Yokogawa has obtained the ISASecure EDSA certification for the ProSafe-RS safety instrumented system to assure customers of its high reliability.

The ISASecure program has been developed with the goal of accelerating the industry-wide improvement of cyber security for industrial automation and control systems. It achieves this goal by offering a common industry-recognized set of device and process requirements that drive device security, simplifying procurement for asset owners and device assurance for equipment vendors.

The ISASecure EDSA certification has three elements: communication robustness testing (CRT), functional security assessment (FSA), and software development security assessment (SDSA), and is based on the IEC 62443-4 standard.

that HART systems may not be invulnerable after all.

Questions remain about whether similar hacks can be applied to Foundation fieldbus and Profibus devices as well. Some industry experts believe that the identified vulnerabilities in DTMs and IP, since they were already known, are the real issues here. Others point out that since the access is through the device itself this is quite a different vulnerability. The truth lies somewhere in-between, as does the importance of the revelation.

You can see Bolshev's presentations on www.slideshare.com but the real stuff is in the speakers' notes, so you'll have to download the presentations. (<http://tinyurl.com/pyqxgbl>; and <http://tinyurl.com/qdokm8r>).

An analysis from Byres

Eric Byres, chief technology officer for Tofino Security, a Belden brand, was in the audience at the S4 meeting, and said, "Yes, I saw the HART talk and it is real - the guy could do a number of nasty things over HART and to HART devices and HART masters. Of course, it requires physical access to the HART wiring (unless HART-IP is involved, which removes that requirement), but sneaking over a fence and getting to a level transmitter sitting on some tank in the far corner of the site shouldn't be that hard (at least not hard on some of the sites I have been to)."

"And once you get to one transmitter, you can rule them all," Byres continued. "If the asset management system that is the master is as flawed as the master he showed us, then it won't be long before you owned the entire asset management system and everything it talks to. In all, a nice back door into the site."

It is important to note that there are many different ways to build a HART product and a HART gateway. It very well could be that the one Bolshev selected is less-well designed and less-well secured than competitive devices. It is doubtful that customers will try to make that differentiation.

Level 0 vulnerability

This vulnerability, like the Target hack, and like Stuxnet, is a Control System Level 0 vulnerability. That is, it uses a field device or controller as its vector, rather than the network itself. As such it is nearly impossible to see happen, or perhaps even to trap for. You are infecting the data stream from a simple field device, not trying to raid an application directly. The system assumes you are inside and are whitelisted. What the HART hack gets you is access to the control system, to the asset management system, and from there to the plant operations system and the ERP system. Essentially, if it works as well as Bolshev says, this is a golden key to the plant — and the enterprise.

No one has yet used the HART hack. Wait....how would we know? Nobody has caught anybody using Bolshev's hack. If somebody in Russia, or in China or wherever has been doing this, they could have been doing it for years and nobody'd be the wiser.

The good news

According to Joe Weiss and several other experts, it is not likely that the HART hack reported at Digital Bond's S4 conference last week will work with a WirelessHART network. While the "man in the middle" attack reported by Bolshev does work for wired HART, the joining security of WirelessHART was designed specifically to keep a "man in the middle" attack from succeeding. Bolshev reports that he didn't try to include WirelessHART in his demo.

The key findings in Bolshev's attack remain that DTMs and transmission over IP continue to be vulnerabilities. This was, actually, known before, but Bolshev's demonstration shows how they can be compromised from the instrument itself. That's relatively new. (...Continued on p8)



Eric Byres:

"The guy could do a number of nasty things over HART"



INSIDER... EDITORIAL

Vendors and Security — It's a Hard Life!

Pity the poor vendors. They have been producing control systems and field instruments that have made industry hundreds of times more productive than even fifty years ago. Up to three or four years ago, they never were asked to do anything other than make the systems robust and easy to use, so that engineers and operators didn't have to do much to learn how to use them. And in the fullness of time, they did, successful to the extent that a few years ago, Honeywell gave Eastman Chemical an award for keeping their TDC2000 longer than anybody.

But now there are problems. Too many people have become interested in penetrating control systems with evil intent. We know that networks are vulnerable. "Anything with an IP address can be hacked," is a well-known catchphrase among the hacking community. We now know that even field instruments are vulnerable, and we know that PLCs can be used to make rotating machinery fail catastrophically, both in Iran and in the United States (the Aurora vulnerability).

Asset owner company managements are still insisting that the purpose of control systems is to be efficient and simple to operate, but, oh, yeah, make them secure too. And let us keep the systems for forty years before we have to buy new ones.

Absent relative radicals like DigitalBond's Dale Peterson who is insisting that every critical infrastructure company be forced to rip and replace every insecure system they have with new, supposedly more secure systems, vendors are in a very tight squeeze.

And even if Peterson gets his wish, will the systems that replace the old, insecure systems be less hackable than what we have? There's a serious question, because, just like idiots, they make smarter hackers all the time.

Now, companies are telling vendors that they want systems that make them more productive, more agile, and even easier to operate because of the shortage of trained operations personnel going forward. AND make them more secure, please.

The interesting thing to note is that companies are not appearing to really deal with the issue of security in the workplace, just as some of them are not willing to really deal with the issue of safety.

NERC, which is really the trade association of electric utilities in the United States, has taken the opportunity granted to it to regulate itself to pretend, ostrich-style, that cyber security can be basically ducked—so that in court, after the inevitable crash from cyber attacks, they can defend themselves by claiming that they were in

compliance with the CIPS (regulations that they, themselves wrote). And in the same court cases, want to bet they won't be blaming Emerson, Siemens, ABB and Schneider for building systems that could be attacked successfully?

The same thing seems to be happening in many industries. The chemical and oil and gas industries have taken the lead in making sure that the systems they buy are more secure, and they work at making sure that the way they are installed and the way they are operated are more secure, but dozens of industries seem to be waiting until somebody (government or their insurance company) forces them to change.

Could it be that they know that the cost of real security is far higher than whatever they would pay for "more secure" field devices, controllers, control systems, asset management systems, and MES systems?

It is, because real security doesn't have all that much to do with the technology. It has everything to do with "social engineering" as the hackers call it. The way to be secure is to insist that the operators, engineers and anyone that interacts with the control systems and field instruments maintains security as Job One. If you can get them to not do stupid things like plug a USB stick they picked up in the parking lot into the control system's engineering work station to see what is on it, or not plug their music hard drive into the control room computers so they can rock out as they run the plant, or any number of other really insecure actions, you can improve the cyber security of a facility considerably. You may even be able to improve the cyber security of a facility enough to make it very difficult to hack the systems inside it.

But that kind of effort requires training and instilling discipline into the workforce, and monitoring and maintaining that discipline and training. That costs real money, and companies have historically been unwilling to spend money on training and development of employees. There has never been an emphasis on having happy and contented employees that are more interested in protecting the facility either. Costs too much money.

Instead, what they've done is to put the burden on the vendor community. And even though some vendors have been open about the fact that the burden of security is about 25% to the vendor and 75% to the asset owner, it doesn't seem to have penetrated.

So pity the poor vendor whose control system is the one that is hit with the first huge attack that is successful in destroying a power plant, or an oil refinery.

.....Walt Boyes

Eastern investment in nuclear UK

EDF of France is expected to finance the Hinkley Point C reactors by sharing the project with Areva (10%), the manufacturers of the EPR - European Pressurized Reactors – that will be used, and the China General and National Nuclear Corporations (up to 40%). These EPRs will also be used in Sizewell C, later.

Toshiba of Japan is to purchase the 50% stake in the NuGen company owned by Iberdrola of Spain, as well as a further 10% from GDF Suez of France, to become the majority shareholder. The Nugen project plan is to build a power station at Moorside in West Cumbria (next to Sellafield), and will use three of the Toshiba Westinghouse AP1000 reactors, to produce 7% of the UK electricity requirement.

Hitachi in 2012 bought the Horizon project company from the previous German owners: Horizon plans to build nuclear plants at Oldbury, and Wylfa in Wales, and use the Hitachi-GE Advanced Boiling Water Reactors (ABWRs).

The result will be that the UK will have a mix of nuclear technology, with three different types of reactor: this is seen as an advantage, in terms of restarting the UK nuclear supply chain with companies providing components for all types of reactor.

One expert, asking to remain unidentified, suggested that this might be a spur toward adoption of WirelessHART over wired HART.

What is true is that ANY network protocol including ALL industrial network protocols, can be compromised. It is becoming clearer with each of these demonstrations that effective security means more than writing “safe code” (whatever that is) and includes physical security as well as good training practices. ISA has made serious strides with standards and the ISA Security Compliance Institute certifications.

We can expect to see more demonstrations like this on industrial networking protocols. Does this mean they are unsafe? Mostly, no. If you're looking for cookbook solutions, you probably won't find them. What you'll get is competent engineered solutions to security issues.

ABB launches “Authorized Value Provider” network

In the UK, ABB has announced the next phase in the development of their much admired networks (admired that is, by competitors) providing local independent electrical service and expertise, known as the ABB Drives Alliance and the separate ABB Motor Service Partners. Now to be amalgamated and known as an “ABB Authorized Value Provider”, the members of this new network have all been vetted, and the required staff members have all been trained and approved by ABB as fully competent and conversant with their drives and motor products. These independents will be allowed to use the revered ABB logo (the proper red one) on their vehicles and publications, a major step forwards in the ABB attitude. The new network recognizes that these independents now provide the vehicle that results in 30% of the ABB industrial motors and drives business in the UK.

This original model has already been copied overseas - and a world-wide roll-out of the enhanced 'Authorized Value Provider' network is taking place.

It was maybe 20 years ago that in order to standardize procurement systems, UK water authorities introduced a vetting procedure for suppliers, in a system known as “Framework agreements”. With the geographically largest water supply and waste treatment companies, such as Severn Trent, the local operating divisions had developed good working relationships with local contractors, who supplied motors, drives and electrical services for their dispersed pumping stations and sewage works.

Adapting to the market

Faced with a Framework Agreement requiring blanket coverage across the whole water authority operating area, the story goes that these local specialists teamed up with their colleagues operating in adjacent towns, and in the form of an “alliance”, offered the required services – across the whole of the required area.

Presumably a switched on sales manager in ABB recognized the potential and value of this team of electrical specialists, who had become embedded in one of his major water industry customers. Very soon ABB adopted this approach across the UK, and set up their ABB Drives Alliance network, and a second ABB Motor Service Partner network, bringing together the best local suppliers of these products into a coherent network. [While they used the ABB name in their logo, this was not the true red ABB or the ABB typeface]

Reaping the benefits

The benefits to ABB, apart from the additional sales, were in terms of feedback of customer application knowledge, requirements, and field proven ideas into the design and development departments, refining the product features, particularly for the water industry. The idea was lifted and copied in other ABB sales organizations in other countries.

A spin-off benefit was that when the competitors found the concept attractive, where ABB had done their homework properly, the most experienced and best local suppliers, contractors and installers were already signed up by ABB – there

were few left for the competitors to haggle over and appoint.

Inevitably in the development of the new programme, some of the original partner companies from 20 years ago have dropped out. This might have been because they were not able to meet the ABB requirements for stock or staffing levels, or maybe they did not wish to invest in this expansion. So the UK network now has around 23 companies, slightly less than before. The network has also taken in some specialists working in the associated robotic automation business.

Future development

ABB claim that there are around 250 providers listed globally within their current Authorized Value Provider (AVP) programme, and that the concept is already being developed further – for example there are new developments coming through adding product features requested by the providers, such as the ACS880 drive for synchronous motors, and in the UK there is now a 1MW motor held on the shelf. In addition the ABB field service engineering staff in the UK has a further 25 people.

ABB motors and drives in the UK claims a 30% market share, of which 30% are supplied through the Authorized Value Providers. Again, 30% of this AVP business originates from the water industry. While this success in the motors and drives business is credited by some as due to the clear focus on this (one) product area, ABB anticipate that further AVP members will be appointed to sell other products from the ABB portfolio, for example to include their instrumentation – possibly developing the ABB ‘Instrumentation Alliance’, which was also created many years ago in the UK. This will be a more difficult challenge!

- The official ABB Authorized Value Provider logo uses the US spelling, for which the ABB management apologized to the editors present at their UK press launch. Nevertheless, all the material provided in the UK press pack reverted to the English spelling, ie ‘Authorised’ when the word appeared in the text!

ABB and Schneider agree over motors and drives!

It was Steve Hughes, northern european channel manager for ABB, who announced the creation of the ABB Authorized Value Provider network to the UK press conference, also providing many examples from these providers showing the electrical energy savings and operational efficiency improvements that can be achieved using their expertise, alongside modern ABB motors and drives.

Elsewhere, at an ARC conference three years ago, Clemens Blum of Schneider Electric pointed out that 30% of global electricity demand comes from industry, Hughes quoted that 60% of industrial electricity consumption drives electric motors. With 10m electric motors in UK industry, Hughes reported that a survey of industrial management, at ceo and cfo level, which asked about how they could save money on electricity consumption, had produced a long list of possible actions, starting with renegotiating with or changing their electricity provider. Looking at the use of drives and motors had ranked in a lowly tenth place.

Opportunities after the recession

Obviously the message is not getting through at this company director level, but all the assembled editors agreed that ABB and others had made great efforts to publicize the savings that can be made by using motors and VSDs effectively. During the rest of the meeting, where many of the motor and drive provider companies were represented, a lot of good application examples were quoted. Surprisingly, the recent recession and recovery had created a lot of opportunity: lines closed down in the recession, then re-equipped to meet the recovery, using external contractors (since in-house staff had been reduced) had brought in modern drives and motors. Several plants had noticed the re-started lines were far more efficient than the rest of the factory, and knock-on projects to re-equip elsewhere are scheduled.

Several other projects had enabled efficiency savings in the whole operation:

Yokeless + segmented armature motors

Yasa Motors, in Abingdon UK, has developed an axial flux electric motor and generator that is described as “highly differentiated”: it achieves best-in-class power and torque densities based on proprietary technology, known as “Yokeless and Segmented Armature technology” (YASA). These YASA motors make more efficient use of key materials, and can be produced with simple low-cost manufacturing processes.

The company has won GBP5m (\$7.8m) of additional investment from existing and new investors, to increase their production capacity to meet customer demand, and to expand their commercial activities. These customers are quoted to cover a wide range of markets, including marine, agriculture, industrial and construction equipment along with automotive and aerospace.

One initial application of this small and lightweight motor has been to replace the hydraulic motor normally used in the starting system of a gas turbine, to spin the turbine up to speed. For turbines modified from aero-engines, the reliability improvement available compared to the conventional hydraulic motor means that replacement by a YASA technology electric motor offers a significant improvement.

Shale gas news

Total of France is the first oil major to announce an investment into shale gas exploration in the UK, having acquired a 40% stake in two shale gas exploration licences in Lincolnshire, on the eastern coast, and committed \$50m to future work.

With the availability of low cost shale gas (methane) in North America, much more attention has turned towards the catalytic (therefore low cost) conversion process to turn methane into an ethylene feedstock for use in petrochemical plants. Honeywell International and Dow Chemical are known to be developing such conversion processes, but a newcomer is Siluria, which by last March had raised \$66m from various venture capital groups, including The Wellcome Trust.

Ethylene is the most used petrochemical and a key ingredient in plastics. Siluria ceo Ed Dineen, previously coo at LyondellBasell Industries, says Siluria is building a demonstration plant at Braskem's site in La Porte, Texas, to show how oxidative coupling of methane, or OCM, can produce ethylene. This \$15 million factory should open in the fourth quarter of 2014.

The Siluria OCM process costs \$1Bn a year less than average costs at naphtha crackers that produce ethylene and is \$250m cheaper than ethane cracking.

in his first example Blaise Ford of Inverter Drive Systems (IDS) mentioned the supply of VSDs to control the extractor fan speed in McDonalds' kitchens – by linking the fan speed to the power being delivered to the kitchen appliances, the fans run faster only when the kitchens are busy. The saving in power reached 50%. Separately a patented idea from IDS uses the VSD monitoring systems to estimate the thickness of sludge being pumped from a sewage tank, by relating this to the fluid viscosity. By cutting off the discharge when the sludge becomes thin, Severn Trent claim to have halved the number of sludge road-tanker journeys needed. This IDS system is undergoing trials now in Anglian Water in the UK.

Rockwell first quarter 2014 results — up, Up, UP!

On January 29th, Rockwell Automation reported fiscal 2014 first quarter sales of \$1,591.7m, up 7% from the \$1,489.2m of the first quarter of fiscal 2013.

Here's an important statement: "Organic sales growth was also 7% as the net effect of acquisitions and currency translation was negligible". So the 7% is a real indicator of company health and growth.

Fiscal 2014 first quarter adjusted EPS was \$1.47, up 20% compared to adjusted EPS of \$1.23 in 2013. Total segment operating earnings were \$328m in the first quarter of fiscal 2014, up 19% from \$276m in 2013. Total segment operating margin increased to 20.6% from 18.5% a year ago, primarily due to higher sales.

In layman's terms, this means that they sold more stuff and sold it at a higher profit. This is a very good thing.

According to Rockwell, their fiscal 2014 first quarter net income was \$198.1m or \$1.41 per share, compared to \$161.4m or \$1.14 in 2013. Pre-tax margin increased to 17.1% in the first quarter of fiscal 2014 from 14.6% last year.

Keith Nosbusch, chairman and ceo said "Sales in the US were robust and I was pleased to see the Asia-Pacific region return to growth. Overall organic sales growth of

7% and adjusted EPS growth of 20% provide a strong start to the fiscal year."

Longbow Research, which follows ROK, commented just before the release of these



Keith Nosbusch

Q1 numbers, "We are also encouraged by the positive commentary regarding ROK's attempt to increase its presence in oil and gas, a key part of its strategy of nearly doubling its process sales by 2017. Its FY14 guidance was encouraging and with an improving US we think ROK more likely than not delivers

growth toward the upper end of guidance and could have a few quarters of positive surprises."

Luckily for Rockwell, they don't need to double process sales by cutting it out of their competitors' hides. There is, as Siemens Industry ceo Helmuth Ludwig comments elsewhere in this newsletter, a very large pot of money available for upgrades and new systems, and there is more than enough for every vendor in the space.

Commenting on the outlook, Nosbusch added, "Given our performance in the first quarter, we are raising the low end of our guidance. We now expect organic sales growth of 3 to 6% and adjusted EPS of \$6.00 to \$6.35."

Rockwell Q1 figures in detail

Rockwell's two business units provided interesting results as well. Control Products & Solutions fiscal 2014 Q1 sales were \$895.8m, an increase of 8% from \$831.7m last year. Organic sales increased 9% and currency translation reduced sales by 1% point. Segment operating earnings were \$116.1m in Q1 2014 compared to \$92.8m in Q1 2013. Segment operating margin increased to 13.0% in the Q1 fiscal 2014 from 11.2% a year ago, primarily due to higher sales.

Architecture & Software fiscal 2014 first quarter sales were \$695.9m, an increase of 6% from \$657.5m last year. Segment operating earnings were \$211.9m

in Q1 fiscal 2014 compared to \$183.2m in 2013. Segment operating margin increased to 30.4% in the first quarter of fiscal 2014 from 27.9% a year ago, primarily due to higher sales. The first quarter results also benefited from the favorable resolution of some legal issues, which contributed approximately 1% point to the segment's operating margin in the quarter.

President Obama visits Vacon drive plant in NC

Barack Obama, President of the United States, has paid an official visit to the North Carolina facility of ac variable speed drive expert, Vacon. He was accompanied by Ernest Moniz, United States Secretary of Energy. The purpose of the visit, which included a tour of the Vacon facility, was primarily to identify and highlight options for increased co-operation between universities and industry leaders like Vacon, with a view to enhancing business prospects and creating new job opportunities.

Unlike most past administrations, the Obama administration has put quite a lot of money where their mouths are—supporting advanced manufacturing with funding for prototypes, putting together public and private partnerships, and funding organizations like the Smart Manufacturing Leadership Coalition (SMLC).

In his 2013 State of the Union address, President Obama said of the National Additive Manufacturing Institute, which is the home of research on 3D printing and other additive manufacturing techniques, *“Last year, we created our first manufacturing innovation institute in Youngstown, Ohio. A once-shuttered warehouse is now a state-of-the art lab where new workers are mastering the 3D printing that has the potential to revolutionize the way we make almost everything. There’s no reason this can’t happen in other towns. So tonight, I’m announcing the launch of three more of these manufacturing hubs, where businesses will partner with the Departments of Defense and Energy to*

turn regions left behind by globalization into global centers of high-tech jobs.” That’s mouth and money moving in synch for sure.

Dan Isaksson, vice president of vedium voltage drives at Vacon, who was one of the President’s hosts, said, “We were privileged and honored to welcome President Obama to Vacon. We arranged a tour of our R&D lab, demonstrating how Vacon is actively involved with making the world and our way of living more sustainable in terms of energy efficiency.”

In a speech he made at North Carolina University shortly after his visit to Vacon, President Obama said, “Vacon is making systems more efficient, saving businesses big bucks on energy costs and improving the environment. Those savings get passed on to customers, and put money in people’s pockets. And growing companies that need the products that Vacon makes, they’re benefitting enormously.”

Vacon, headquartered in Finland, is the world’s largest company focusing solely on AC drives, which are used to control the speed of electric motors to maximize energy efficiency. Vacon’s operations in North Carolina are focused on research and development of Vacon’s new product line, medium voltage AC drives.

Systems Integrator from Russia wins US award

In their annual awards this year, *Control Engineering* has recognized Insist Avtomatika of Omsk, in Russia, as the winner of their System Integrator of the year award, in the \$10-18m annual revenue category. This is the first time this magazine award has gone to an integrator based outside North America – but in fact it is the third time Insist Avtomatika has been one of the finalists in this category.

Established in 1993, Insist Avtomatika has implemented over 400 automation and information system projects that enable safe operation of Russia’s largest oil and gas fields, many in harsh and dangerous environments. They have been a CSIA certified integrator since 2005, and ISA certified since 2006 – and are quoted

Stainless steel 3D printing - again

Following up the 3D printing story from last month, a visit to the Science Museum in London found this engine part produced in stainless steel by an industrial 3D printer.



Like the industrial polymer printer, this printer uses a high energy laser to fuse powder together and build up an object layer by layer. Any unused metal powder can be recycled.

The sample was provided by Renishaw Ltd, plus also Delphi Diesel Systems, and the 3D Printing Research Group at the University of Nottingham.



Simon Scott, director of the Renishaw Additive Manufacturing Products Division, who make these 3D printing machines.

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as showing a commitment to independent reviews, striving for excellence.

Vladimir Morenko, director general of Insist Avtomatika commented: "We are



Vladimir Morenko

honored to receive this prestigious international award, which is the proof of recognition of our expertise, skills and background. We will strive for further growth to justify our place among the best world companies and develop long-term relationships with our customers".

Recent projects reported on their website have included work on the Gazprom Neft Moscow refinery, where a Yokogawa CentumVP-based DCS and Yokogawa ProSafe-RS-based ESD system were engineered and put into operation on the isomerization facility and recycling water supply unit.

Another project involved the use of Allen Bradley controllers applied to the automatic control of multiple oil heaters at the crude oil facility of the Lukoil Tevlinsko-Russkinskoe field in Western Siberia.

Other awards in the system integrators category went to Cogent Industrial Technologies of Canada (up to \$10m revenue) and Wood Group Mustang of the USA (over \$18m in annual revenues).

Good news - FCC makes new radar level gauge rules

According to MCAA, the Measurement Control and Automation Association, the FCC has amended its rules about radar level devices, which they call 'Level Probing Radars'. The industry calls them radar level gauges.

Cynthia A Esher, president of MCAA, said, "The Federal Communications Commission (FCC) has adopted rules geared specifically to level probing radars (LPR) which are made by a number of MCAA members. These devices are now allowed to operate anywhere in the country without a license—in both open air environments and tanks. MCAA worked closely with the FCC throughout the regulatory process, providing information to the technical office within the FCC, which crafted a Notice of Proposed Rulemaking in 2012. The FCC action amends the existing rules to account for

LPR special technical characteristics, which posed previous obstacles to FCC approval. MCAA supplied critical information to the FCC for their use in the preparing the new rules."

This is really good news. The worst, wettest, and coldest three days I've ever spent were climbing on tanks at what was then the Upjohn Pharmaceuticals plant in Kalamazoo, MI, doing a full dress FCC survey of the multiple radar level gauges we (TN Technologies) had installed. Somebody noticed the whole bunch of radar transmitters within 500 feet of the Kalamazoo International Airport runway. Panic ensued, and, with first generation GPS in hand, I was dispatched to do a survey. I am glad to see that the FCC has finally agreed with the data we developed, and has even permitted open-air applications of these level devices.

The decision by the FCC also harmonizes the regulations with the European Telecommunications Standards Institute (ETSI) standard for LPR devices, which, as Esher points out, makes US manufactured radar level devices more competitive in Europe and wherever ETSI standards are used.

Esher commented "The effort by MCAA is an important demonstration of the power of a group of committed companies to make something happen for the benefit of all. In this case, a group of less than a dozen companies worked together on wording for changes to the existing rules and funded an effort to work through legal counsel well versed in dealing with the FCC and its procedures for regulatory change. They offered commentary and specifics throughout the process."

Russian Nuclear finance for new Hungarian plant

In a January deal, Russian President Putin and Hungarian PM Viktor Orban have agreed that Russia's Rosatom will double the size of the existing 2400MW nuclear plant, at Paks, the only nuclear plant in Hungary. This site runs four Russian VVER-type reactors, built in the 1980s, and produces 40% of the power currently needed. The deal will be 80% financed by a 30 year loan from Russia of Euro10Bn (\$13Bn), and the plant will be on stream by 2023. Hungary is dependent on Russia for supplies of all nuclear fuel, natural gas and oil, so most supplies of energy resources come from Russia.

- Expect the next **INSIDER** on 11 March