INSIDER
INDUSTRIAL AUTOMATION & PROCESS CONTROL

VOLUME 21
NUMBER 12
ISSN2334-0789
December 2017

Your key to the latest industrial automation and process control information

Inside this issue:

Extreme Badness from Malware and Design Flaws Impact Industry

First, there's the Triton Exploit
In 2004, Triconex safety expert Robert Adamski told me, "I'm going to share my nightmare with you." He proceeded to talk about, not a safety issue, but a cyber security issue. He predicted that it would be possible to penetrate a control system and enter the safety instrumented system, the SIS, which is designed to safely shut down a plant in the event of a failure in the process. He explained exactly how his hacker, "Let's call him Ali al Qaeda," would be able to do that, and he dared me to tell him it couldn't happen.

Ever since then, I have been talking about Bob Adamski's nightmare, and nobody has ever been able to tell me it couldn't happen.

The best they could do was to assert, pretty baldly, that it was highly unlikely, that it would require great resources, and would not happen because it would potentially cause extreme damage. Neither Adamski, who passed away a few years ago, nor I ever believed much in that argument, and we've been waiting for Bob's nightmare to come true.

Well, now it has. Not quite as badly as Adamski feared, and no plant was destroyed. But an attacker targeted an SIS system, and caused it to shut down the plant.

The best description of what happened, and what the malware can do is in a blog by Heather MacKenzie of Nozomi Networks. You can read the entire blog here. She makes some important points.

"The attack reprogrammed a facility's Safety Instrumented System (SIS) controllers, causing them to enter a failed state, and resulting in an automatic shutdown of the industrial process," MacKenzie wrote.

"The attack is bold and notable," she said, "because it is the first known industrial control system (ICS) attack that has targeted and impacted not just an ICS, but SIS equipment. Also, the type of SIS attacked is widely used and is commissioned in a consistent way across many industries."

She then makes an important point. "The SIS system that was attacked was a Schneider Electric Triconex Safety Instrumented System (hence the malware moniker "TRITON", also known as "TRISIS".) **However, the malware was not designed specifically for Triconex, it was designed because the target organization was using Triconex** (emphasis added)."

What MacKenzie, and Nozomi Networks' partner, Fireye, which discovered the exploit, says is that FireEye is moderately confident that the attacker inadvert-

Cyber Badness Strikes Industrial Control Systems (continued)

ently shutdown operations while developing the ability to cause physical damage. You can read their reasons for coming to this conclusion, and many other important details about the attack, in the FireEye blog post on TRITON.

MacKenzie notes, " It is the first known malware targeting SIS, and only the fifth malware known to specifically target ICS (after Stuxnet, Havex / Dragonfly, Blackenergy2, and Industroyer / CrashOverride)."

It is likely that if the target enterprise had been using another SIS system, the exploit would have targeted that one instead of the Triconex system.

Now that the exploit has demonstrated that SIS systems as a class are penetrable and vulnerable, we can expect to see more attacks.

"Cassandras" like Joe Weiss, myself, Eric Byres (of Tofino fame) and others have been pointing out for a decade that there is a thought gap between data security, which most cyber security systems are based on, and process safety. You cannot have a secure system unless it is a safe system. You cannot have a safe system unless it is a secure system. We can no longer ignore this fact or Bob Adamski's nightmare will become all too real.

Intel, AMD, and Other Processors Vulnerable

If the Triton Exploit weren't enough, the entire computing world was rocked in December and early January by the revelation that processors by Intel, ARM, AMD, and even Qualcomm (one of the largest manufacturers of mobile device processors) are vulnerable to a series of vulnerabilities, like Spectre and Meltdown, which leave them open to attack.

How this impacts the automation industry is obvious. Since the major automation vendors abandoned making their own chips, almost forty years ago, chipsets by Intel, ARM, AMD and others have been used in everything from sensors to controllers, to the computers that DCS and SCADA systems run on. The computers that serve as cloud servers are not immune either.

A report from CNET describes the issue: "Researchers found two major weaknesses in processors that could let attackers read sensitive information that should never leave the CPU, or central processing unit. In both cases, attackers could see data that the processor temporarily makes available outside of the chip.

Here's why that happens: To make computer processes run faster, a chip will essentially guess what information the computer needs to perform its next function. That's called speculative execution. As the chip guesses, that sensitive information is momentarily easier to access."

Spectre and Meltdown (which targets cloud servers) can be used on systems that are not patched to prevent it, to permit unauthorized entry into the system. Now, it is in the industrial space that systems will potentially NOT be patched.

This is because in many cases, the system cannot be shut down to patch it, or the system is running on an archaic processor. There are thousands of Windows XP systems running in the industrial environment. There are instances of even Windows 3.11 and DOS systems running processes yet today. These systems cannot be patched.

Intel and the others state that the flaw has existed for at least twenty years, so all those archaic systems are vulnerable.

CNET reports, "Researchers, chipmakers and computer companies all say there are no known examples of hackers using these weaknesses to attack a computer. However, now that the details of the design flaws and how to exploit them are publicly available, the chances of hackers using them are much higher."

As the Triton Exploit and others have proven, hackers up to and including nation states, have been trying to penetrate Industrial Control Systems for at least a decade and a half already. This just gives them another avenue to exploit. And as the ICS malware exploits we have already seen show, it is not all that difficult to attack a control system that is not adequately defended.

Operating system manufacturers like Apple and Microsoft are scrambling to patch their systems so that the exploits cannot be used. But the fact that it exists in nearly all processors means that it will be hanging over us for a long time. In the meantime, be wary of phishing and other means of achieving entry into your control systems. Be afraid. Be very afraid.

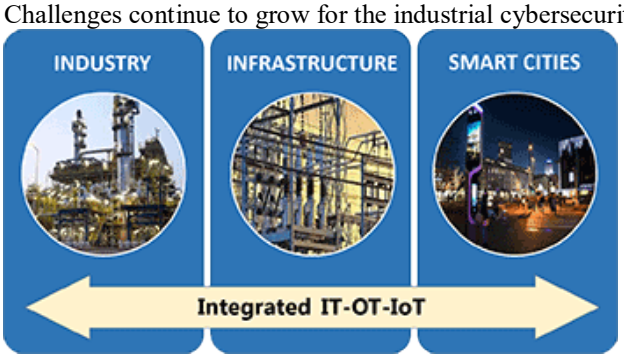
The ARC Orlando Forum Is Coming!

Presenting the 22nd Annual ARC Industry Forum: Digitizing and Securing Industry, Infrastructure, and Cities

February 12-15, 2018 - Orlando, Florida

It's happening fast. Everywhere we turn, things and processes are becoming more connected and intelligent. Streetlights, cars, gas turbines, and thermostats stream data. Buildings, refineries, oil platforms, mines, and wind turbines are optimizing asset and operating performance. Parking meters and distributed power grids deliver value to both consumers and operators. Design software can link to additive machines to print parts directly. And it's only the beginning.

Challenges continue to grow for the industrial cybersecurity community. Broader deployment of operational technology is expanding the use cases requiring protection. Resource shortages are undermining the effectiveness of established defenses. Blurring boundaries between IT, OT, and IoT are increasing the need for more integrated, collaborative cybersecurity strategies.



How will disruptive technologies change existing products, plants, and cities? Can cybersecurity threats be overcome? When will machine learning and artificial intelligence transform operations? Will open source solutions impact traditional software and automation domains? How will a digitally-enhanced workforce stem the loss of tribal knowledge? How do connected products create opportunities in aftermarket services? What steps can organizations take to foster innovative thinking?

There are countless ways to conduct your digital transformation journey, too many technologies and suppliers to evaluate, and endless choices to make along the way. Embedded systems, networks, software platforms, augmented reality, and machine learning may play a role as you begin to improve uptime, optimize operating performance, enhance service, and re-think business models.

Join us at the 22nd Annual ARC Industry Forum in Orlando, Florida to learn more about how digitizing factories, cities, and infrastructure will benefit technology end users and suppliers alike. Discover what your peers are doing today and what steps they are taking in their respective journeys.

For more information, or to register, visit:

https://www.arcweb.com/events/arc-industry-forum-orlando

Endress-Hauser Continues Consolidation Trend in Distribution

E+H Appoints TriNova in Upstate New York and New England

When your editor first began working in the automation industry, distribution in North America was defined by the Dodge marketing territories.

These were county-by-county (later modified to be zipcode-based) distribution and representation maps, published by the F. W. Dodge Company. Every automation company representation contract used these territories. There was the "Northern California Territory" for example, which included the counties of Western Nevada, but not Clark County (home of Las Vegas and the military bases).

These territories have become more and more irrelevant. There are several reasons for this.

First, the economics of the small, family-operated, one- or two-person rep firm, or distribution company decayed. It now costs approximately $500 to make a single sales call. The traditional "eight calls a day" sales methodology simply stopped working.

Second, the generational shift left many second- or third-generation rep/distributor owners looking for exit strategies because they didn't really want to work in the family business, or couldn't make a living at it any longer.

Third, the better capitalized rep and distributor firms started expansion plans that focused on either buying a small rep or distributor in a new territory or simply bypassing existing distribution and starting up an entirely new enterprise, and soliciting crossover from their existing principals.

Endress+Hauser has been working with this level of consolidation since the early 2000s. At one point, they even purchased a representative firm which was in financial distress, and kept it running. Now, they've done it again, in New England and Upstate New York.

TriNova Inc. is a long-time representative and business partner of Endress+Hauser, and is 50 years old as a company. The company is the automation supplier's Sales Representative and Authorized Service Provider in the southeast and has now expanded its operations in New England and Upstate New York from new offices in Ballston Spa, NY.

The two companies have spent the last three months preparing for a smooth transition by staffing the new office and training personnel. Teams have been established and are ready to provide customers in the new territory dedicated support and services in all markets and industries.

TriNova HQ in Mobile, AL

"We are pleased to have the opportunity to expand our partnership with TriNova in the New England and Upstate New York region," said Chris English, Vice President of Sales, Endress+Hauser.

And, just as this issue is going to press, E+H announced that they were partnering with their rep and service provider in Oklahoma, Vector Controls to put together a consortium to work in the oil field industry, with partnerships with Angus Measurement Services, TechnipFMC and its Authorized Service Provider, Vector Controls. The automation companies will collaborate to bring added value to the oil and gas industry, assisting customers with transition to the digital oilfield. The partnership alignment between the automation companies is to inform and better prepare the oil and gas industry and customers for Industry 4.0. The oil and gas industry has played a pivotal role in the economic transformation of the world. Today the industry can set new parameters and direction through digitalization.

Endress+Hauser's intelligent field instruments and digital-communication expertise captures and transmits product quality, quantity and value; Angus' systems fabrication and technology consultants helps customers optimize the performance of gas, oil and water assets; TechnipFMC's oil and gas measurement technology and design capabilities deploy best-in-class technology and develop modularized systems; and Vector's expertise in gas analytics, measurement and control provides the opportunity to deploy best-in-class solutions.

Angus Measurement Services is a measurement company that specializes in the fabrication of liquid hydrocarbon custody and allocation measurement systems. Their measurement systems include: Crude Oil Custody Transfer Measurement Systems, LACT / ACT (Lease Automatic Custody Transfer / Automatic Custody Transfer) Systems, natural gas liquid measurement skids, Crude Oil Sample Systems, and Provers.

TechnipFMC is a global leader, with more than 40,000 em-

More E+H...

ployees, in subsea, onshore/offshore, and surface projects, with proprietary technologies and production systems, integrated expertise, and comprehensive solutions.

Putting the partnerships together for Endress+Hauser is Vector Controls, their metastasized rep/distributor in the lower Midwest, with experienced application specialists in their Instrumentation and Automation, Analytical Solutions, Valve and Valve Automation and Technical Services divisions to support all process applications, controls & automation, and service needs. Vector has Regional Support Centers and professionals located throughout Texas, New Mexico, Oklahoma, Arkansas, Kansas, and Missouri.

At the risk of being accused of spending too much ink on a single company, we want to talk about the insistence of millennial engineers and technicians to be able to use the tools they've grown up with: laptops, tablets, and smart phones.

Endress+Hauser has introduced the Field Xpert SMT70, a rugged tablet PC for commissioning and maintenance staff to manage field instruments and document the work progress. The tablet comes preinstalled with DeviceCare device configuration software and device library —so it is ready to go, right out of the box.

E+H Field Xpert SMT70

The Field Xpert SMT70 supports HART, PROFIBUS DP/PA, FOUNDATION Fieldbus, Modbus, CDI and Endress+Hauser service interfaces. It can connect to field instrumentation devices directly via a USB or Bluetooth wireless modem, or via a gateway, remote I/O or multiplexer to a bus system .

The Field Xpert device library has more than 2,700 pre-installed device and communication drivers, allowing it to work with many different instruments from a wide variety of vendors. The drivers can be used to communicate with virtually all HART and FOUNDATION Fieldbus devices, and additional device drivers (DTMs) can be easily installed if required. Generic HART DTM and PROFIBUS profile DTMs also enable communication with field devices using these protocols.

The Field Xpert SMT70, therefore, works with virtually every modern field instrument with "One Click Connectivity." To connect the Field Xpert SMT70 to a HART flowmeter, for example, the operator simply clicks on the app, which then prompts the user to select Automatic Cconnection and the app connects to the instrument, and the tablet is ready to perform diagnostics, configurations or commissioning with the built-in device configuration software. The tablet also supports Endress+Hauser Heartbeat Technology and FieldCare instrument diagnostic and monitoring functions.

The tablet PC has Windows 10 Pro software installed. It comes with an 11.6 inch Multitouch HD display, a 5MP auto focus camera, a 2MP front facing camera, and up to 256 GB storage. Communication ports and supported networks include USB, Ethernet, HDMI, Wi-Fi and Bluetooth—with 4G LTE and GPS available as an option. The battery runtime is 14 hours. The tablet comes in a general purpose configuration as well hazardous area configuration for Class 1, Division 2 Groups A,B,C,D, T4 and Class 1, Zone 2, Groups IIC, T4

The question is whether the millenial operators and engineers will be satisfied by an industrially-hardened Windows 10 PC, or whether they will insist on using their own devices. Some companies have been experimenting with BYOD (Bring Your Own Device) programs. The issues of security, safety, and data management are yet to be completely addressed with BYOD programs, however.

This appears to be becoming a much more important issue than it would appear. Millenials in general are unwilling to work with what they consider inferior tools, and are unwilling to do things that they think are a waste of time.

It may be, however, that there is a bit of silver lining. The regulatory climate may favor the elimination of most Class I Division 2, or equivalent, spaces in plants because of the success of fugitive emissions control.

That would allow Millenials to use whatever BYOD devices they want, when they want. Then all we have to do is to figure out security.

THE WAY I SEE IT
Editorial

Is Malware the Achilles Heel of the IIoT?

The big appeal of the Industrial Internet of Things is the potential vast increase of meaningful information we could obtain by increasing the sheer number of sensors and the analytical methodologies of Big Data and the latest visualization tools for working with that data. The central axiom of the IIoT is that this information will be used to operate plants and even entire enterprises much more profitably.

There are some obvious problems with this axiom, It is pretty glaring that you have to collect the right information. It doesn't help to add 100 or 1000 sensors to a process if the values of those sensors aren't critical information. The problems don't stop there.

We have pointed out before that the cost of sensors must decrease dramatically before the IIoT can become a reality. I remember hearing a friend from Shell saying that if they needed a measurement, they'd be willing to pay for it. The flip side of that is that if the cost of making those measurements goes down substantially, the impetus for needing the measurement goes up.

Comments? Talk to me!
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Read my Original Soundoff!! Blog:
http://www.spitzerandboyes.com

But the real issue that IIoT boosters don't want to talk about is security.

There are two basic schools of thought about IIoT security. One is that nobody would try to penetrate a network through its edge devices. The other is that the problem is so large that it is basically unsolvable, so who cares.

The first school of thought is the same old "security by obscurity" nonsense. Our concepts of cyber security have been formed by network-centric security experts. There have been some lonely security researchers, like Joe Weiss, and others like the INSIDER who have been pointing this bias out for years. And for years, we have noticed a steadily growing number of "security researchers" at Blackhat and other gatherings, who have concentrated their research on network penetration through the sensor network.

The other school of thought is much more pervasive and even more insidious. This claim is the reason that there is always the next patch coming out for software. You can't solve the problem because there are always smarter black hats.

Somehow, it seems to us, that both schools of thought are missing the point. Which is that if the potential users of the Industrial Internet of Things see that from a cost-benefit viewpoint the potential loss from an attack far outweighs the potential gain from all that beautiful information, adoption of the IIoT will stall.

We are already seeing this in the commercial IoT world. Sales of Nest thermostats and household control systems have stalled. People are concerned. Now, with the latest revelations about inherent design flaws in Intel, AMD, and other processor chips, they are becoming frightened. All they can see to do is to pray that nobody ever attacks *them*. And we see the same fear in the industrial space.

So, if the IIoT is to be a success, we have to focus on two things. First and foremost, we need to make security inherent in every device and the firmware and software that runs on them, from field sensor to process controller to MES and ERP systems.

And, second, we need to focus on providing the right information at the right time, or there will be no value add with the IIoT.

End users vote with their feet, and their dollars, pounds, euros, pesos and yuan. For all the ballyhooed new IIoT centric plants, there are dozens more built to the old standards, because we are sure that they work, and the perceived risk is less.

Change the risk and the IIoT will grow to its potential.

ABB and The State of the Automation Industry

With contributions by Nick Denbow and Walt Boyes

INSIDER
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Health Watch

The automation vendor space has been filled with news and noise about acquisitions and changes to companies like Emerson and Rockwell Automation. While Emerson may decide to go after Rockwell again, they are laying low and acquiring companies in the peripheral space, like Cooper-Atkins, a manufacturer of temperature controllers and systems for the refrigeration industry.

As we get ready for the ARC Advisory Group Forum in Orlando, Fla., in February, it is interesting to look at another company that is quietly changing its business plans and strategies. We begin with some observations by contributor Nick Denbow, formerly editor of the INSIDER.

ARC Advisory Group is one of those typically American consultancy organizations that produces reports describing technology trends and competitive analyses that are then sold to the suppliers in the industry. Undoubtedly, they are also employed to produce specific reports at the request of single specific clients, but the main reports publicized for public sale are the overall market surveys. Without paying a lot of money, the general public don't get to see these.

All the data from the reports is generalized, and as ever, subject to interpretation, so hopefully each client can find something that reinforces his optimism about his company's place in the market. So they are essential sources of backup data for Board presentations and the like.

The ARC DCS market study

The recent ARC report on the "Distributed Control Systems Global Market 2016-2021" report provided ABB with sufficient confidence to issue a Press Release stating that the ARC had confirmed ABB to be the '#1 supplier of Distributed Control Systems Globally', with a 20% market share 'across industries', making ABB the leader of 'digitally enabled control and automation'. This is a continuation of the position they have held according to ARC since 1999.

Peter Terwiesch, President of the ABB Industrial Automation division echoed these findings: "With our installed base of over 70 million connected devices and 70,000 control systems, and an annual investment of $1.5 billion in research and development, ABB is leading the digital transformation of industry."

Such reports and statistics were the bread and butter, and even the honey, for the reports written for the Industrial Automation Insider newsletter that your editor produced from 2010 to 2015. The focus for such a report would have been that with at most seven major suppliers competing for the top slot, a 20% market share would imply the dominance margin is (still) fairly slim!

The ARC report provides a competitive analysis of the market shares of leading suppliers by geographical region, and broken down into eleven major industry groups, as well as equipment type, project size and style. The ABB release specifically mentions the ABB activity as delivering sustainable progress for power, water and process industries.

The ABB Profile

More interesting in many ways were the specific project examples picked out by ABB as the prime examples of their expertise in several sectors, viz:

"ABB's leadership in DCS stems from countless ground-breaking projects around the globe. ABB Ability System 800xA plays a key role in securing the success for Sadara, the world's largest chemicals complex built in a single phase. The monitoring and automating of the entire production process is fully integrated with System 800xA, all coming together in 18 control systems and 260 operator work stations. The integration capabilities also helped the Garpenberg mine to become one of the world's most

ABB and The State of the Automation Industry (continued)

With contributions by Nick Denbow and Walt Boyes

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cost-effective and modern mines in the world. Hoists, mill drives, ventilation, dewatering, substations, conveyors, crushers, ore storage, and maintenance, as well as document management and communications are seamlessly integrated to the automation system. Very recently Emami Cement has chosen System 800xA to automate its new production plant which will help boost infrastructure growth in India.

"ABB Ability Symphony Plus is, for example, the core solution for integrating new emission control technology at a power plant in Wisconsin, US; for protecting the UNESCO World Heritage site of Venice, Italy from high water by controlling the city's MOSE flood barrier system; for providing the automation and electrification solution for Adani, the world's largest solar power plant in a single location, in Kamuthi India; and for enabling the Vietnamese utility Saigon Water Corporation (SAWACO) to control and operate its infrastructure in real time, significantly reducing the amount of non-revenue water."

ABB and HPE bring intelligence to industrial plants

ABB and Hewlett Packard Enterprise (HPE) announced a strategic global partnership that combines ABB's industry-leading digital offerings, ABB Ability™, with HPE's innovative hybrid information technology (IT) solutions. The partnership will provide customers with solutions that generate actionable insights from vast amounts of industrial data to increase the efficiency and flexibility of their operations and create competitive advantage.

According to both ABB and Hewlett Packard, customers will benefit from ABB's deep domain expertise in operations technologies (OT) and HPE's leadership in information technologies (IT). ABB and HPE will deliver joint industry solutions that merge OT and IT to turn industrial data into insights and automatic action, combining widely-adopted cloud platforms like Microsoft Azure with IT systems running in corporate data centers and at the edge of the network. Employing the right mix of IT platforms will accelerate data processing in industrial plants and at the same time enable effective control of industrial processes across locations.

"This strategic partnership marks the next level of the digital industrial transformation. Together, we will bring intelligence from cloud-based solutions to on-premises deployments in industrial plants and data centers for greater uptime, speed and yield," said ABB CEO Ulrich Spiesshofer. "ABB and HPE will deliver solutions that span the entire range of computing required by enterprises today, from the edge to the cloud to the core."

ABB claims an installed base of 70 million connected devices, 70,000 digital control systems and 6,000 enterprise software solutions. HPE has been helping customers optimize their IT environments with secure, software-defined technologies that seamlessly integrate across traditional IT, multiple public and private clouds and the intelligent edge to drive key business outcomes.

"This alliance between two global leaders is unprecedented in terms of breadth and depth, and it will be ground-breaking for the progress of the Industrial Internet of Things," said Meg Whitman, CEO, HPE. "Together with ABB, we will shape a digital industrial future where everything computes, equipping machines with intelligence to collaborate, allowing plants to flexibly adapt to changing demands, and enabling global supply chains to instantaneously react to incidents. This partnership will create exciting business opportunities for our joint customers."

To provide a true end-to-end experience for customers, the ABB-HPE partnership will include co-innovation, co-development, joint go to market and service.

Research firm IDC forecasts that worldwide spending on the Internet of Things (IoT) will grow to $1.4 trillion in 2021 from an expected $800 billion in 2017. The largest investments are being made in areas such as manufacturing, transportation and utilities.[1] To tap into the opportunities of the IoT, companies are investing in new solutions that digitize their industrial equipment and integrate it with their broader IT environments. By joining forces, ABB and HPE are bringing together the capabilities needed to accelerate this transformation.

Computing where it is required

Running data acquisition, analytics and control processes near industrial equipment helps customers avoid the latency, security and reliability issues associated with data communication through remote IT systems. ABB and HPE will jointly develop, market and service digital industrial solutions that help customers create deep insights and automatic action from industrial data – by running ABB Ability™ applications on enterprise-grade IT systems close to the industrial equipment to accelerate the processing of vast amounts of data; and manage and control industrial processes across the supply chain – by leveraging hybrid IT to pro-

ABB and The State of the Automation Industry (continued)

With contributions by Nick Denbow and Walt Boyes

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Health Watch

vide a seamless experience from edge to cloud to core, making critical data available across locations.
The partnership will enable ABB Ability™ solutions to run on hybrid platforms such as HPE ProLiant for Microsoft Azure Stack, enabling customers to deploy applications to their preferred location – on HPE infrastructure in industrial plants and data centers or in the Microsoft Azure public cloud – to meet the specific requirements regarding performance, security or cross-site collaboration.
ABB and HPE will also deliver joint solutions for data centers, including data center automation – to enable data center power, cooling and building systems automatically adapt to changing IT demands or incidents. To that end, ABB and HPE will integrate ABB Ability™ Data Center Automation, which controls, monitors and optimizes mission-critical data center facilities infrastructure, with HPE OneView, HPE's IT infrastructure automation software into a secure edge data center – specifically designed to run in harsh industrial environments, bringing enterprise-grade IT capacity closer to the point of data collection and machine control. This solution is being developed in collaboration between ABB, HPE and Rittal, the world's largest manufacturer of IT racks, and will be an off-the-shelf ready IT data center solution for industrial customers enabling real-time insight and action.
The partnership was announced today at the HPE Discover conference in Madrid, where both companies demonstrated their first jointly developed solutions and prototypes.

ABB completes EPC business model change

ABB took actions across three divisions to shift the center of gravity towards strengthened competitiveness, higher growth segments and lower risk in line with Next Level strategy.

ABB in December announced actions across three divisions to complete the business model change for engineering, procurement and construction (EPC) as it ends its transition year 2017. These decisions are fully in line with ABB's strategy to shift the center of gravity towards strengthened competitiveness, higher growth segments and lower risk.

In the Power Grids division, ABB has signed an agreement to form a joint venture with SNC-Lavalin for electrical substation EPC projects; SNC-Lavalin will have majority and controlling interest. The new entity will leverage ABB's power technology leadership and SNC-Lavalin project expertise to capture opportunities for profitable growth. These actions complement the ongoing "Power Up" program; as part of this program, ABB started to shift its focus towards solutions and service-based customer offerings.
In the Industrial Automation division, ABB has previously announced the oil & gas EPC joint venture with Arkad Engineering and Construction Ltd., a fully integrated EPC contractor for the energy sector based in Saudi Arabia; the closing of the transaction is now expected by December 31, 2017.
ABB's current oil & gas EPC business will be transferred into the new JV company, in which, Arkad will have majority and controlling interest. The new JV company, Arkad-ABB S.p.A., will provide the full range of integrated EPC services for oil & gas plants. It will build on more than 50 years of experience in oil & gas EPC and the successful delivery of more than 300 projects globally.
In the Robotics and Motion division, ABB has decided to wind down its turnkey full train retrofit business, beyond meeting current contractual commitments. Robotics and Motion will continue its strong role as innovation partner for the rail industry.
"We are taking decisive actions to complete our EPC business model change as we end our transition year. These actions are in line with our strategy to shift our center of gravity towards strengthened competitiveness, higher growth segments and lower risk," said ABB CFO Timo Ihamuotila "We will book the related charges in Q4 2017 and report the divisions starting in 2018 excluding these legacy businesses."
The fourth quarter 2017 results of Power Grids and Robotics and Motion are each expected to be impacted by approximately $75 million on operational EBITA.
The transfer of the turnkey oil & gas EPC business into the JV with Arkad is expected to result in a non-operational pretax charge to net income of approximately $75 million.
ABB will report these businesses as a non-core operating unit within Corporate & Other. This unit is expected to retain and execute parts of the existing legacy backlog until the transition out of these businesses is complete. The new unit will report to ABB's CFO Timo Ihamuotila effective January 1, 2018.

ABB clearly isn't sitting on its hands, or on the money it saved by buying B&R instead of Rockwell.

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The INSIDER is edited by Walt Boyes. Joy Ward is a columnist. Additional reporting is done by David W, Spitzer PE., Rajabahadur V. Arcot, Nick Denbow, and Steven Meyer.

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Send comments to insider@spitzerandboyes.com. We want to hear from you!

Rajabahadur V. Arcot: India's expanding economy and emerging growth opportunities

India, with a growing economy, has been an important market for global automation supplier companies for the past couple of decades.

Resulting from the growth dynamics that are in play in the country, the economic and industrial profiles of the country are undergoing changes. The transformations taking place will further enhance India's importance for the global automation industry.

Some of these initiatives are major course-corrections and hence have lingering negative impacts in the near-term.

Until now, process industry control system suppliers mainly benefitted because of large investments that have been taking place in industries, such as electric power, oil and gas, cement, and steel.

With the expected expansion of industries relating to construction & infrastructure development, electronics & semiconductors, and defense in the coming years, the future looks bright for discrete industry automation suppliers as well.

Influenced by global trends, even electric power industry, which presently accounts for a significantly large share of the control and instrumentation market in India, is at an inflexion point. Investments in fossil fired power plants are set to decline. According to industry sources, by 2030, almost 40 percent of the country's total generating capacity is expected to come from renewable energy sources.

Renewable electricity generation, which presently stands close to 50 GW, is set to rise to 175 GW by the year 2022, with solar power contributing to almost 100 GW. This implies boost to the growth of industries relating to production of solar cells and modules, battery, invertors, and such others.

The automotive industry's plan to switch over to electric vehicles by 2030 will also provide additional impetus for the growth of the battery, charging stations, and other related industries.

After course corrections, India's economy scales back

India's economy, as it expands, keeps mutating and evolving with the State initiatives continuing to play a crucial role.

Some of these initiatives are major course-corrections and hence have lingering negative impacts in the near-term. Examples of such initiatives are the recent measures to free the economy of the influence of unaccounted money through demonetization of high value currency notes and the introduction of more transparent and efficient Goods and Services Tax (GST). While both these measures are long-term positive for the Indian economy, their near-term impacts have been negative leading to growth slowdown in recent quarters. The World Bank's report - Global Economic Prospects - that was released a few months after demonetization, foresees GDP growth to scale back. Also, it attributed the initial growth slowdown to the withdrawal of a large volume of currency in circulation and their subsequent replacement with new notes.

While responding to questions on the slowdown in India's growth, World Bank President Jim Yong Kim called the recent slowdown in India's economic growth as an "aberration" caused by temporary disruptions due to the introduction of GST. He further said that GST will have a positive impact on the Indian economy.

According to the newly released data, India's economic indicators have turned positive once again and point to economic revival. The United Nations' *'World Economic Situation*

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and Prospects 2018' report, which states that India will clock a GDP growth rate of 7.2 percent in 2018 and 7.4 percent in 2019, reaffirms this optimism.

According to the report, India, driven by robust private consumption, public investment, and government reforms, is set once again to emerge as the fastest growing economy in the world.

Other reports are also positive about the country's growth prospects. The Indian economy is expected to witness a sharp recovery in the first quarter of 2018 and its GDP growth is likely to be around 7.5 per cent for 2018, says the recent Nomura report.

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Transformations and Initiatives underway augur holistic and sustainable growth

Additional economic and industrial transformations are also underway and they are expected to spur the country's economy further and contribute to accelerating growth and making the growth more holistic and sustainable.

Until now, the service & informal sectors and domestic private consumption largely contributed to the country's economic growth. The manufacturing sector's contribution was mainly related to meeting the essential needs of a nascent economy, such as electric power, steel, and cement. While subsequently it began to encompass industries, such as generic pharmaceuticals, petroleum refining, and automotive, the country continues to depend on large-scale imports to meet the ever-expanding needs for consumer durables, electronic goods, defense equipment, and such others. With imports exceeding exports, the country, already, finds it challenging in balancing its trade account and the deficit is unsustainable in the long run. This situation dictates the growth of a manufacturing industry that caters to the needs and wants of evolving consumers and the country.

The manufacturing industry presently contributes to only 15 percent of India's GDP. Driven by the fact that the growth of the service industry and private consumption beyond a point can be sustained only when they are backed up by the growth of the manufacturing industry that is broad-based to meet the aspirational wants of consumers, India is making efforts to increase the role of manufacturing both for achieving sustainable economic growth and job creation. The '*Make in India'* program aims to make the country a manufacturing hub and push the share of the manufacturing industry to 25 percent from the present 15 percent, and in the process create millions of jobs in 25 industry verticals that include electronics and electronic systems, defense equipment, and infrastructure, such as construction of roads & highways, ports and others.

Yet another feature of the Indian economy is that its growth until now has been domestically funded. With limited access to capital, the country had to prioritize its investment. As a consequence, enough funding was not available for the development of infrastructure, such as the construction of roads, highways, ports, cities and others.

Wealth generation that the country has witnessed in the last couple of decades has contributed to increased domestic savings, tax collections, and growth of banking & other financial sectors. In addition, India has become attractive for global institutional investors and has emerged as an attractive investment destination. Investment in physical assets, such as gold has been the traditional means of savings in the country. But that is changing.

More and more domestic savings are finding their way to the banking and financial sectors. This is helping the country to channelize funds for building the country's infrastructure that include building smart cities, railway networks, highways, waterways, airports, industrial corridors, and such others.

For example, the government has approved plans to develop approximately 84,000 km of roads by 2022, the biggest highway construction plan so far in the country. Other projects that the country has embarked upon are the *Smart Cities Mission* and *Sagarmala*.

Smart Cities Mission is an urban renewal and retrofitting program by the Government of India with a mission to develop 100 cities and make them citizen-friendly and sustainable with the help of technology. *Sagarmala* is a series of projects to leverage the country's coastline and inland waterways to drive industrial development and encompasses modernization and enhancement of port infrastructure, improve port connectivity, create 14 coastal economic zones, and develop skills of fishermen and other coastal and island communities. India needs over $1.5 trillion in investments in the next 10 years to bridge infrastructure gap, said India's Finance Minister Arun Jaitley recently.

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India set to become destination of choice for automation companies

India, apart from working on these catch-up strategies as a latecomer to industrial development, is also focusing on making the country future-ready. The *Digital India* program is a flagship program of the State with a vision to transform the country into a digitally empowered society and knowledge economy. It aims to make government services available to citizen electronically through online infrastructure and by making the country digitally empowered.

> **"...this unmatched U.S.-Indian industry partnership directly supports India's initiative to develop private aerospace and defense manufacturing capacity in India." — Lockheed Martin press release**

India has developed a 12 digit unique-identity number, called *Aadhaar,* based on their biometric and demographic data. With close to 1.1 billion enrolled members already, it is the world's largest biometric ID system. The Indian State is slowly pushing people to use this biometric ID system as proof of their residence, for opening of bank accounts, for availing social security benefits, and such others.

There is also a strong thrust to make people use digital payment systems and thereby wean them away from cash transactions. All these initiatives mean greater reliance on information technology and this will spur the growth of discrete industries, such as semiconductors & electronic systems, smart phones and other communication equipment & gadgets, smart sensors & actuators, and similar others.

Perforce, defense is yet another industry which is expected to witness robust growth. Strategic compulsions dictate that India builds a more vibrant domestic information-technology hardware and defense industrial base.

The annual consumption of electronic hardware in India is expected to touch US$ 400 billion by the end of the decade. If the domestic industry's growth does not accelerate, India may well have to depend on imports to the extent of US$300 billion annually. It is imperative for the electronic industry to robustly expand if India is to avoid the impending import nightmare that can push the country into a spiral of unsustainable imports. This would necessarily entail higher external debt / borrowings and this does not bode well for India's economy in the long term. India is the fourth largest spender on defense. Due to geopolitical compulsions, India's defense spending accounts for almost 1.8 percent of the country's GDP and this is set to increase. Only about 35 percent of the required defense equipment is manufactured in India. If we take into account the import component of materials that go into domestic production, both at the system and sub-system levels, the overall import content may exceed 70 percent.

There are clear indications that these hi-tech industries are growing. Apple has announced its plans to make its iPhones in India, one of the fastest growing markets for smart phones.

According to available reports, the company is taking the *'Make in India'* route. According to the Lockheed Martin's recent news release, the company has signed an agreement with India's Tata Advanced Systems to produce F-16 fighter jets in India. The news release goes on to say that "this unmatched U.S.-Indian industry partnership directly supports India's initiative to develop private aerospace and defense manufacturing capacity in India." The company is eyeing orders worth billions of dollars from the Indian Air Force. A few months ago Dassault Aviation laid the foundation stone for the Dassault Reliance Aerospace Limited's manufacturing facility in India. Dassault Aviation is investing over 100 million euros in this a joint venture project to manufacture aircraft components as part of the 'offset obligation' connected to the purchase of 36 Rafale fighter jets from France.

With all these exciting developments taking place in India, the country is emerging as a destination of choice for automation suppliers. The party has begun.

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