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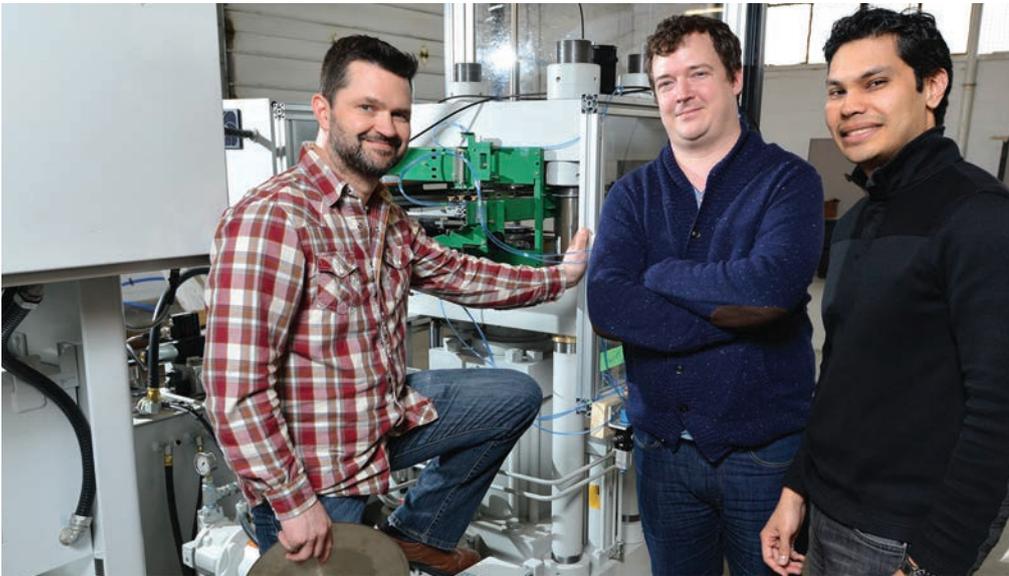
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12 MACHINERY

Viryl Technology taps automation to put a modern spin on vinyl record pressing.



16 CYBERATTACKS How hackers are duping unsuspecting employees into revealing what's supposed to be secure information.



19 THE LAW A look at the legal and safety issues related to weed in the workplace.



23 CANADIAN HIGHLIGHTS ECM showcases its big e-house.



27 ANNIVERSARY The 1950s introduced Canada to a long period of post-war industrial prosperity.

FEATURES

- 17 EXPORTING** Avoid the tyranny of the immediate to expand globally.
- 18 TRAINING** Don't forget administrative basics when welcoming new employees.
- 20 THINK LEAN** Some tools are better than others when problems need a quick fix.
- 22 ENERGY** Ecogate delivers savings for Teknion.
- 24 MAINTENANCE** Make a case for reliability adding value to capital projects.
- 26 CLIMATE** Ontario unveils its cap and trade emissions scheme.
- 28 GOVERNMENT** Big spending to spur innovation in Federal Budget 2016.
- 30 CONNECTIVITY** 2016 will be all about IIoT implementation.
- 31 CARGO THEFT** Outfit docks to make them safer while preventing tampering and theft.

DEPARTMENTS

- 4 Editorial
- 6 News
- 7 Off-Site
- Careers
- 11 PLANT Pulse
- 31 Supply Lines
- 33 Product Focus: Safety
- 36 Products and Equipment
- 41 Plantware
- Events
- 42 Postscript

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Setting a price for carbon

When Prime Minister Justin Trudeau met with Canada's premiers to nail down a national approach to a carbon tax – or as he likes to call it, carbon pricing – there was much back patting because they had come to an agreement on the need for a “mechanism.” But there were no specifics on how it would work. The details will be hashed out later.

Despite the collegial, sunny vibe, Trudeau and the premiers are not necessarily on the same page. All the players are anxious to be seen as climate change warriors, yet they have their own political agendas based on what they can sell their businesses, industries and constituents.

Carbon pricing has a cost. It's far from clear what that cost will be.

BC has been operating its own carbon tax regime, which has proven to be effective and it hasn't been a drag on the province's economy. Alberta is putting together its own initiatives in a province heavily reliant on the good fortunes of the energy industry, Saskatchewan doesn't want to add to the burden of its energy companies, Quebec is working a cap and trade scheme and Ontario plans to do the same.

Well, good luck to them.

In a world so reliant on fossil-based energy, whatever action Canada takes – and at the risk of repeating this point – it will be for the most part symbolic, because we are responsible for less than 2% of global greenhouse gas emissions. Greater urgency for action lies with China (28%), the US (16%), Europe (10%), India (6%), Russian Federation (6%) and Japan (4%). Not that the rest of the world (responsible for 30%) should do nothing. But whatever action Canada takes must be carefully calibrated to avoid t-boning the economy.

With that in mind, Ontarians should be wary of the provincial Liberal government's cap and trade scheme. It's supposed to bring in \$1.9 billion that will be invested in so-called green projects.

Manufacturers already struggling with challenges operating in the province may be skeptical. After all, this is essentially the same crew of fumbler, chairs shuffled, that was responsible for the \$2 billion gas plant debacle and the poorly planned and executed renewable energy initiative that has not come close to delivering promised jobs or investments.

BC has a better approach. The money its carbon tax generates goes back to the taxpayers, without damaging what has become the fastest growing economy in the country.

In a letter to Trudeau prior to the meeting with the premiers, Jayson Myers, president and CEO of Canadian Manufacturers & Exporters, warned that neither a carbon tax nor cap and trade will be much good without measures that encourage capital investment; in fact, they could be damaging if they divert money “that could otherwise be invested by consumers or industry in new technologies, into general government revenues or high-risk technology unicorns with little chance of commercial success or widespread adoption here in Canada.”

Myers says we'll have to triple the rate of technological progress to achieve a reduction in greenhouse gas emissions of 30% below present levels by 2030. He recommends a cross-government approach that includes: tax and financial incentives for investment in and adoption of more productive, less emission-intensive products and technologies; funding for the construction of smarter, more efficient energy and transportation infrastructure; reducing regulatory impediments to putting new technologies and infrastructure in place; and ensuring industrial investment is not lost to other jurisdictions only to generate even more emissions elsewhere.

Ontario's government and Trudeau should be especially mindful of his last point.

Joe Terrett, Editor
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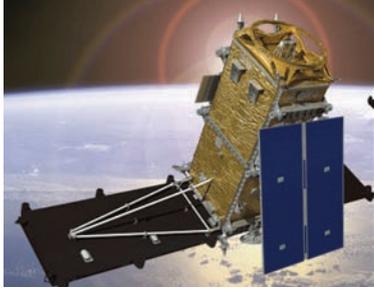
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BULLETINS



MDA space surveillance system. PHOTO: MDA

MacDonald, Dettwiler and Associates Ltd., a global communications and information company based in Richmond, BC, is developing multiple communication subsystems to be integrated into Airbus Defence and Space's Inmarsat-6 mobile communication satellites. The contract is valued at more than \$20 million.

Brampton Brick Ltd., based in Brampton, Ont., is picking up most of construction materials manufacturer Eurobloq Inc.'s assets, including a concrete products facility in Boisbriand, Que., for up to \$6 million. The acquisition adds production and distribution capacity to Brampton Brick's masonry and landscape products in Quebec and Eastern Ontario.

Lamperd Less Lethal Inc. a Sarnia, Ont. manufacturer of less lethal weapons and ammunition used for defensive purposes, has signed a new distributor in Canada. **Defense Optics Group** in Pickering, Ont. has dealers in the UK and Africa, Canada and the US.

Firan Technology Group Corp., a Toronto-based supplier of aerospace and defence electronics subsystems, says its FTG Circuits facility in Chatsworth, Calif. has qualified for MIL-PRF-31032 Military certification. It allows the facility to manufacture and certify high technology flex and flex rigid printed wiring boards that contain up to 35 layers.

Linear Transfer Automation, a Barrie, Ont. manufacturer of automation systems for the auto sector is getting \$2.5 million in financing from Export Development Canada (EDC). The revolving line of credit will cover large export contracts, including work for **Ford, Nissan, GM, Daimler** and **Honda**. Linear has 80 employees at the Barrie plant, and plans to create 10 new positions in the next year.

Sika opens new BC concrete plant

Will serve the Pacific Northwest region

SURREY, BC — Sika Canada's new mortars and concrete admixtures plant is now fully operational.

The 2,800 square-metre plant in Surrey, BC represents the company's expanding footprint as it moves farther west from its base in Point-Claire, Que.

The company, a subsidiary of Sika AG in Switzerland, says the facility includes a modular mortar plant, and liquid concrete admixture blending equipment that produces high-range water-reducers, air-entrainers, set-retarders and set-accelerators.

The building also includes two laboratories for quality

control, an integrated warehouse and an office space for administrative and sales personnel.

Sika says the automated plant meets local environmental regulations for air quality, noise management and the handling of light chemical materials.

The operation, based in the Pacific Northwest, will shorten lead times for the mortars and grouts the plant produces, while reducing shipments from its Alberta and Montreal plants.

The Surrey facility brings the number of Sika's production sites to 18 in North America, four of which are in Canada.



Ribbon cutting ceremony with Sika employees and customers. PHOTO: SIKA

ABB locates in Halifax to serve Maritime Link Project

HALIFAX — ABB is expanding its presence in Atlantic Canada by opening an office in Halifax.

The global provider of power and automation technologies with Canadian headquarters in Montreal, said the Halifax office will provide engineering and project management services for ABB's participation in Emera's Maritime Link Project.

The transmission system that includes 180-kilometre subsea cables will deliver hydroelectric power from Cape Ray, NL, to an area near Point Aconi in Cape Breton.

ABB's portion of the project includes the construction of a high-voltage direct current solution. The company is preparing the sites for the installation of converter station equipment in Woodbine, NS, and Bottom Brook, NL.

The project scope includes work at two 230 kV alternating current (AC) substations in Newfoundland, one 345 kV AC substation in Nova Scotia, and two cable transition stations.

The ABB Group is based in Zurich, Switzerland.

IBC signs \$4.8M supply deal

WILMINGTON, Mass. — IBC Advanced Alloys Corp. has signed an exclusive four-year supplier agreement valued at US\$4.8 million with a global manufacturer of semiconductor and electronics assembly equipment.

IBC, a manufacturer of advanced alloys and precision castings based in Vancouver (with plants in the US), will supply the unnamed company with its Beralcast cast components.

Beralcast alloys are three times stiffer than aluminum with 22% less weight and can be substituted for aluminum, magnesium, titanium, metal matrix composites as well as pure beryllium or powder metallurgy beryllium-aluminum.

A mechatronics simulation centre for Seneca

TORONTO — Seneca College has opened its Mechatronics Simulation and Demonstration Centre, a first-in-Ontario facility that will help students develop cutting-edge skills for the manufacturing sector.

Mechatronics integrates electrical, mechanical and computer engineering that applies in aerospace, materials processing, machine building, automotive, transportation, building technologies and mining.

The Ontario government has invested \$651,000 to purchase state-of-the-art equipment for the new Toronto centre, which will be used to simulate manufacturing scenarios.

The new equipment includes: a mechatronic manufacturing training system; 20 simulation computers; 10 specialized computers; 10 industrial controllers; 10 pneumatic robots; and 24 industrial motors.

The college estimates by 2018 nearly 1,000 students across eight programs will directly benefit from the centre annually.

Ontario is also investing \$7 million for a Technology Education and Collaboration Hub at Confederation College in Thunder Bay, Ont. which will offer preparatory, apprenticeship, trades and technology programs.

The innovative workshop and laboratory space will help fill skills needs in Northern Ontario.

Seaspan gets \$65.4M for vessel contracts

...and Raytheon gets \$36 million for weapons systems

VANCOUVER — Vancouver Shipyards will receive \$65.4 million under the federal government's National Shipbuilding Policy to build a scientific support vessel and Joint Support Ships (JSS).

The two new contracts allow Seaspan's Vancouver Shipyards Co. Ltd. to initiate early discussions with potential suppliers and to purchase material and equipment such as propulsion systems, scientific equipment, generators, and other specialized parts. They'll go into an Offshore Oceanographic Science Vessel (OOSV) for the Canadian Coast Guard.

The OOSV contract, valued at up to \$30 million, is the second project in the non-combat package. An 86-metre-long Offshore Fisheries Science Vessel with a capacity for a 33-person



National Defence Minister Harjit Sajjan tours the Seaspan Vancouver Shipyard.

PHOTO: GOVERNMENT OF CANADA

crew and up to 23 scientists, is to be completed in 2018-2019.

The \$35.4 million JSS contract for the Royal Canadian Navy will cover the selection of equipment such as propulsion systems, generators, switchboards and other specialized parts needed to finalize the design of the ships.

The Joint Support Ships are part of the National Shipbuilding Strategy's non-combat

vessels package, with an estimated project budget of \$2.3 billion, will be built after the off-shore vessels. The first JSS will be operational in 2020, and the second ship by late 2021.

They'll replace the Royal Canadian Navy's Protecteur Class Auxiliary Oiler Replenishment ships, which were recently taken out of service.

The support ships will allow Naval Task Groups to remain at sea for long periods providing fuel, ammunition, spare parts, food, and water.

They'll also support deployed forces with modern medical and dental care facilities, and will have helicopter repair capabilities.

In an unrelated procurement, Raytheon Canada Ltd. will get \$36 million to acquire up to 58 naval remote weapon stations that will defend against naval and aerial threats, including small boat and low-slow flyers, in all visibility conditions.

They'll be installed on Canada's existing fleet of modernized Halifax-class frigates, and on future Queenston-class Joint Support Ships.

CAREERS

Joachim Schulz joins Toronto-based Armstrong Fluid Technology as the commercial director, global building business. Schulz has an extensive global background in pumps and engineered equipment, including senior sales and business development roles with Sulzer and KSB.



Joachim Schulz

Anthony Caputo is leaving ATS Automation Tooling Systems Inc. in February 2017. He will remain on the board of the Cambridge, Ont.-based automation manufacturer.

Grant Thornton LLP, the Canadian accounting and advisory firm, has appointed **Robert Scott** national advisory services leader. He brings more than 25 years of advisory and technology-related experience to the position.



Robert Scott

Steve Prahalis has been appointed the director of Canadian operations for SME, which promotes advanced manufacturing technology and development of a skilled workforce. Prahalis joined SME in 2003 and was responsible for the creation and launch of the Interactive Manufacturing Experience. Before joining SME, he was president of Reed Exhibitions Canada.

Vortex Aquatic Structures International, a manufacturer of aquatic play landscapes and entertainment based in Montreal, has appointed **Virginie Guilbeault** vice-president, business development, Europe/Middle East. Guilbeault has served Vortex for 10 years in several business development and marketing functions, playing key roles in developing the company's international business.

Catalyst Paper, a paper products manufacturer in Richmond, BC, has appointed **Sean Curran** senior vice-president, sales and marketing. He replaces **Jim Bayles**, who has retired. Curran was vice-president, sales and marketing with Canfor.

BluMetric wins 3-year gig with tech

OTTAWA — BluMetric Environmental Inc. was awarded a three-year, \$1 million contract to supply occupational hygiene/health and safety services for an unidentified retail outlets and corporate offices of a multinational Canadian technology company.

BluMetric, a clean tech company based in Ottawa, provides occupational hygiene support and services to multinational organizations.

CCL acquires Checkpoint for \$556M

TORONTO — CCL Industries Inc. is acquiring Checkpoint Systems Inc. in a \$556 million merger deal.

The Toronto-based specialty label and packaging manufacturer said the transaction will increase its breadth and scale.

Checkpoint, based in Thorfare, NJ, makes technology-driven, loss prevention, inventory management and labelling solutions. It has 21 plants in 29 countries.

Annual net revenue for 2015 was \$820 million.

PLANT OFF-SITE

Kory Phillips, a federal government employee who lives in Penticton BC, catches up on Canada's manufacturing news while visiting a beach in Varadero, Cuba.

Send (at least 5x7 in., 300 dpi) photos with name, title, company, address and phone number to Off-Site, PLANT, jterrett@plant.ca, and win \$75.

Magna to supply EYERIS to FCA

AURORA, Ont. — Magna International Inc. is supplying its new EYERIS Generation 3.0 camera system for the 2016 Jeep Grand Cherokee and 2017 Chrysler Pacifica.

The global automotive systems supplier based in Aurora, Ont. said the Jeep Grand Cherokee is the first Fiat Chrysler Automobiles (FCA US) vehicle to feature the new camera technology.

Production of the Pacifica began in February after a \$3.7-billion investment at the Windsor Assembly Plant, in Windsor, Ont.

The latest iteration of the EYERIS system improves field of vision as well as camera resolution. It's part of a fusion system with radar in the front of the Jeep that performs functions related to the vehicle's lane keeping, automatic high beam, automatic emergency braking and adaptive cruise control features.

Magna also announced it will open a new seating manufacturing facility in Taizhou, China to supply Geely's Volvo Car Group.

Construction is underway in the Jiju District of Taizhou and is to be completed by mid-year.

The 5,200-square-metre plant will produce complete seating systems for a small crossover utility vehicle, the first automobile to be produced from Volvo's Compact Modular Architecture platform.

Bridgestone invests in Que.

Daily capacity to increase 3,000 tires per year



Joliette plant to get advanced manufacturing equipment. PHOTO: BRIDGESTONE

JOLIETTE, Que. — Bridgestone Canada Inc. is expanding its Canadian passenger and light truck tire plant in Joliette, Que. as part of a potential \$300 million investment over five years.

The Nashville-based tire manufacturer, with 50 production facilities around the world, said the multi-phase expansion is to break ground this year, and will produce larger diameter tires for pickup trucks and SUVs.

New advanced equipment will be phased in over a five-year period, increasing plant capacity by 3,000 tires

per day and bringing daily production to 20,000 tires per day by 2023.

The expansion will be helped along by a \$44 million loan and \$10 million non-repayable contribution from the Quebec government.

Tire Business reports the plant will be expanded 13% to 1.13 million square-feet.

The plant, which is celebrating its 50th anniversary this year, employs 1,300 people.

It produced its 150-millionth tire in 2014 and is the largest private employer in the Lanaudiere region of Quebec.



GM's Supplier of the Year award.

PHOTO: GM

Valiant named GM Supplier of the Year

WINDSOR, Ont. — Valiant TMS, a manufacturer of automation systems for a range of industries, has been named a GM Supplier of the Year.

The automaker recognized 110 of its suppliers from 17 countries during its 24th annual Supplier of the Year awards ceremony March 10 at the Cobo Center in Detroit.

Winners were chosen by a global team of GM purchasing, engineering, quality, manufacturing, and logistics executives.

This is the fourth time (2009, 2013, 2014, 2015) Valiant TMS has received the award.

Solegear acquires bioplastics firm for \$1.33M

VANCOUVER — Solegear Bioplastic Technologies Inc. is acquiring 100% of a Richmond, Ill. manufacturer's bioplastics division for \$1.33 million.

The Vancouver-based manufacturer of bioplastics said amalgamating Ex-Tech Plastics Inc.'s bioplastics expertise under the Solegear brand will accelerate the commercialization of thermoformed bioplastic packaging in food and non-food applications.

Solegear, which has developed proprietary bioplastic formulations Polysole and Traverse, is expanding its strategic partnership with Ex-Tech, a manufacturer of sheet film, which will receive 6,650,000 of Solegear's common shares. Solegear will also be Ex-Tech's exclusive supplier of bio-based materials and additives, while Ex-Tech will be the Solegear's exclusive plastics extrusion service provider in North America.

The asset purchase is expected to provide Solegear with annual revenues of US\$2 million.

Tesla co-founder joins Clearpath advisors

Marc Tarpenning will support self-driving vehicle development

KITCHENER, Ont. — One of Tesla Motors' co-founders has joined Clearpath Robotics as a member of its advisory board to provide entrepreneurial and technical insight.

"We're thrilled to have Marc on our advisory board and work with him on a regular basis," said Matt Rendall, chief executive officer at Clearpath Robotics.

Tarpenning co-founded NuvoMedia in 1998, developer of the Rocket ebook — one of the first handheld devices for digital books.

In 2003 he co-founded Tesla Motors to build electric cars and led the development of the Tesla Roadster, which was the first



Tesla co-founder Marc Tarpenning.

PHOTO: CLEARPATH

production automobile to use lithium-ion battery cells.

Tarpenning is now an active board member and advisor with several organizations and resides in Portola Valley, Calif.

Clearpath Robotics, based in Kitchener, Ont., is a developer of self-driving vehicles for industrial applications.

The company provides hardware, software and services that enable self-driving deployment and fleet operations. It serves several industrial markets including materials handling, mining, military, agriculture and aerospace.

Feds, Ontario to invest \$127K in chocolatier

Provincial funding also going to two other expansion projects

BELLEVILLE, Ont. — The Canadian and Ontario governments are sweet on Bay of Quinte chocolate.

Both governments have announced \$127,000 in funding for Belleville, Ont.'s Donini Chocolate. The company produces the milk chocolate treat in liquid form, shipping 1.8 million kilograms via tankers to Canadian and international customers every year.

The funds will contribute to Donini's expansion plans, boosting its processing capacity and US sales efforts, as well as creating five new full-time jobs. The company's president, Joe Pulla, said the investment has already helped Donini secure a new contract with a large American retail client.

The investment was made

available through Ontario's Growing Forward 2 program for food processors.

The province is also investing \$855,000 from the Southwestern Ontario Development Fund in Steel Technologies to expand its Woodstock metal processing plant.

The company, which is investing \$8.5 million, will add 64,000 square-feet to the existing 80,000 square-foot plant, doubling the plant's current production to meet demand for lightweight materials such as aluminum and advanced high strength steels.

The project is to be completed by the end of 2018 and will add up to 15 jobs to the 75-person workforce.

And Huawei Canada is doubling down on its investment in Ontario.

The Chinese information and communications technology company plans to invest \$303 million through a major research and development project called 5G Ontario.

The project involves new research labs in Markham and Waterloo, and an expansion of the existing research facility in Ottawa. The initiative is to create 250 new jobs over the next five years.

Huawei's main research goals in Canada include developing faster internet speeds and improving offshoot technologies such as cloud computing, data analytics and mobile security.

The Ontario government is contributing \$16 million to the project through the Jobs and Prosperity Fund.

SMS partners with CNC Industries

Focus will be on OEM pins and bushings

ACHESON, Alta. — SMS Equipment Inc. and CNC Industries Ltd. have signed a support and distribution agreement to work together across Canada.

CNC Industries, an Edmonton manufacturer of OEM components for the mining, construction and earthmoving industries, and SMS Equipment, a supplier of industrial equipment based in Stoney Creek, Ont., will focus on pins and bushings for mining and earthmoving equipment.

CNC's Titan line includes pins and bushings for rope shovels, and replacement kits for dozers, scrapers, haul trucks and loaders.



A Titan pin from CNC Industries.

PHOTO: CNC INDUSTRIES

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Two companies share \$6.6M FedDev funding

GUELPH, Ont. — The FedDev Ontario money train pulled into the Kitchener/Guelph area and dropped off \$6.6 million in repayable contributions to two area companies for technology purchases.

Hammond Manufacturing, a manufacturer of industrial and electrical enclosures based in Guelph, received an investment of up to \$3.46 million.

The company will upgrade production of metallic and non-metallic enclosures that protect electrical control panels from dust, oil and water. An investment will also be made in automated equipment to improve production and efficiency. The project includes energy saving upgrades and water recycling investments.

Ontario Drive & Gear Ltd., a manufacturer of power transmission products and the all-terrain ARGO vehicle based in New Hamburg, gets up to \$3.14 million to purchase new gear manufacturing equipment, expand its engineering department by 10,000-square feet and advance new product lines.

The projects are expected to “create or maintain” up to 165 full-time equivalent jobs.

Minimum wage hikes don't help much

VANCOUVER — Raising the minimum wage will do little to reduce poverty mainly because most minimum-wage earners don't live in low-income households, finds a study by the Fraser Institute.

Each province increased its minimum wage in 2015 except New Brunswick, which did so in 2014.

The public policy think tank reports 88% minimum-wage earners do not live in low-income households, as defined by Statistics Canada's Low Income Cut-off or LICO.

Of the total, nearly 60% are teenagers or young adults (ages 15 to 24) often working their first job, with the 85% living with parents or other relatives. Another 20% live with an employed spouse. Two per cent of Canadian minimum-wage earners are single parents with at least one child.

The Fraser Institute contends minimum wage hikes actually decrease employment opportunities for low-skilled workers. Based on Canadian research, a 10% increase in the minimum wage reduces employment for low-skilled workers by between 3% and 6%.

It suggests an alternative – Working Income Tax Benefit (WITB), a refundable tax credit that allows low-wage workers to keep more of their earnings.

Visit www.fraserinstitute.org for a copy of the report.

Molson-Coors brews heritage beer

108-year-old Pale Ale recipe celebrates 230th anniversary

TORONTO — Molson Coors Canada has recreated a 108-year-old pale ale to celebrate the company's 230 years of brewing in Canada.

The limited release 1908 Historic Pale Ale comes from a recipe found deep within the company's archives.

“We sat down with malsters, barley and hops breeders from across the globe to identify the correct ingredients to mix with Molson's ancient ale yeast derived from the same primordial strand John Molson used in the 1700s,” says Keith Armstrong, brewmaster at Molson Coors Canada.

During the brewing process, the density and temperature measurements had to be recorded every few hours to ensure consistency.

The recipe is one of the many historic documents found in approximately 400 cartons stored in the Molson archives.

Molson Coors Canada employs 3,000 Canadians at seven breweries across the country, including boutique breweries Creemore and Granville Island.



The 1908 Historic Pale Ale is available in 625 and 341 ml bottles.

PHOTO: MOLSON COORS

Campaign launched to retrain Alberta oil sands workers for solar

EDMONTON — There's a movement afoot to put Albertans back to work in the renewable energy sector, and a group representing oil sands workers are calling on the Alberta government for support.

Iron & Earth, a nonprofit association, says its Solar Skills campaign seeks to retrain 1,000

out-of-work electricians as solar specialists.

“We're asking the Alberta government for support so we can scale up the training, put more Albertans back to work and build a strong solar industry across this province,” says Iron & Earth founder and boilermaker Lliam Hildebrand.

Over the past year, thousands of oil sands workers have been laid off. The association says on-the-job retraining proposed by the program can get many of them back to work in the new economy, especially as their skills are highly transferable.

Alberta plans to be powered by 30% renewable energy sources by 2030, which means new opportunities in a range of renewable energy sources, including solar, wind, geothermal, biomass and biofuels.

Solar Skills is the first of several planned retraining programs by the organization, which will be looking at putting pipefitters, boilermakers, ironworkers and other building trades to work in the geothermal, wind, biomass and biofuel industries.

Myers resigns from CME

TORONTO — Jayson Myers, the president and CEO of Canadian Manufacturers & Exporters (CME), is leaving his post after nine years leading Canada's largest manufacturing association.

According to a note to colleagues, Myers intends to leave CME in September, ending a 25-year career with the organization.

He'll focus on concluding CME's Industrie 2030 advanced manufacturing strategy.

“It's important for me to pass the torch to someone who can come into a leadership role and work over the next decade to implement some of those priorities,” he told **PLANT**. “I love the manufacturing and exporting sectors, and the next stage of my career will certainly be tied closely to them.”

Rob Hattin, CEO of ProVantage Automation in Grimsby, Ont. and past CME chair of the national board of directors, said a transition team will work over the next six months to find a replacement.



New Flyer's Xcelsior bus. PHOTO: NEW FLYER

New Flyer wins \$175M orders

WINNIPEG — New Flyer of America Inc., a subsidiary of Winnipeg-based New Flyer Industries Inc. has landed two US bus contracts worth a total of US\$175 million.

The manufacturer of heavy-duty transit buses and motor coaches will supply 138 40-foot XN40 Xcelsior compressed natural gas buses to the New York City Transit Authority. The contract is worth \$78 million.

The other order for 172 Xcelsior XD40 clean diesel buses worth \$97 million goes to the Maryland Transit Administration in Baltimore, Md.

Output decline slows

Conditions are improving

TORONTO — Manufacturing output and new orders may have been declining in February, but a resurging US economy and a lower value loonie are finally stabilizing conditions across the sector, according to the latest RBC PMI survey.

The RBC Canadian Manufacturing Purchasing Managers' Index (PMI) conducted in association with Markit and the Supply Chain Management Association (SCMA) registered a 49.4 in February. That's an improvement from the 49.3 in January but still below the 50 threshold for the seventh straight month. Yet it's also the highest reading since August 2015.

Greater export sales were key to supporting manufacturers, with export orders picking up for the fourth consecutive month. But the weaker exchange rate also increased costs. Survey respondents noted higher prices for imported materials and a corresponding rise in factory gate prices.

Although a drop in production levels was reported, survey respondents commented on declining new business intakes and, in some cases, efforts to streamline stocks of finished goods.

Volumes of new work dropped for the sixth consecutive month, which is the longest continuous period since the survey began in late-2010. RBC cited anecdotal evidence that pointed to subdued customer spending and an ongoing decline in sales to the energy sector.

Manufacturers were cautious about input buying for the month, although RBC said the latest drop in purchasing activity was the slowest for eight months. Stocks of purchases increased for the first time since November 2014, but a number of firms linked this to weaker than expected demand patterns.

Payroll numbers dropped again and the rate of job shedding accelerated slightly since January.

The report is based on data compiled from monthly replies to questionnaires sent to purchasing executives in more than 400 industrial companies.

Download a copy of the report at www.rbc.com/newsroom/pmi.

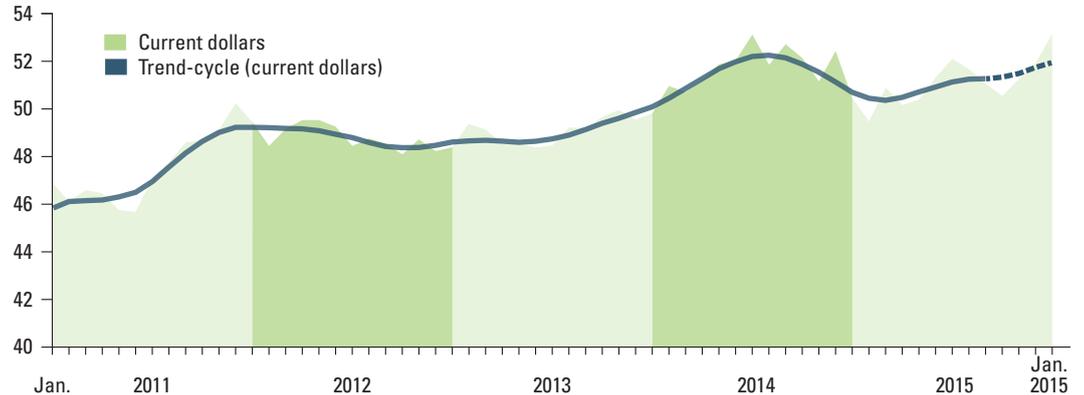
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PLANT PULSE

ECONOMIC DEVELOPMENTS AND TRENDS

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MANUFACTURING SALES ADVANCE IN JANUARY



A lower-value loonie and strong US demand are helping fuel more robust manufacturing sales, which showed a record 2.3% gain in January to \$53.1 billion. The big movers were motor vehicles, food and motor vehicle parts. Take declining petroleum and coal product sales out of the equation, and TD Economics notes the overall gain is an even more impressive 3.1%. TD is optimistic much of the gains will be sustained in coming months and expects most of the upside to be seen across Ontario, Quebec and BC, but other provinces should also share in the spoils.

TD Economics

FRAUD

44%

Small business owners who were defrauded in the past year but didn't report it. Of those who did, only one in three notified law enforcement, while 32% told their banks or insurance providers. Most felt law enforcement couldn't do anything to help them.

Canadian Federation of Independent Business

41,000

Job gains in manufacturing year-to-year from February – a 2.4% increase, despite little change in the month. Growth was driven by Ontario, Quebec and BC.

Statistics Canada



HIGH VOLTAGE

592.8 MILLION

Megawatt hours of electricity Canada generated in 2015, down 1.2% from 2014. Steam, nuclear, combustion, wind and tidal generation recorded lower output but hydro, internal combustion and solar power posted gains.

Statistics Canada



1% The improvement in labour productivity as of Q4 2015, the result of gains in the service sector (0.4%), offset by a 0.6% decline among goods-producers (not manufacturing, though; it was up 0.1%). The year overall saw a decline of 0.2%, following gains of 2.5% and 1.3% in 2014 and 2013 (US productivity was 0.5%). Construction was largely responsible for the change (-5%). Manufacturing slipped by 0.9%. Unit labour costs rose 1.4% marking the fifth straight year in which pay growth outpaced productivity.

TD Economics

VINYL LPs TAKE A MODERN SPIN

NEW MACHINES WILL PRESS OLD-STYLE RECORDS

Viryl Technologies taps automation to enhance traditional-style album pressing.

BY MATT POWELL,
ASSOCIATE EDITOR

The vinyl LP is back from the dead and a small outfit in Toronto's west-end is working to make the resurrection complete.

Viryl Technologies, founded by a group of pals last October, has developed a machine that will bring record pressing into the modern age, putting an automated spin on the analogue music format.

"We realized there was a huge gap in the vinyl market and we wanted to expose that," says CEO Chad Brown, who started the company with colleagues Rob Brown (COO) and James Hashmi (CTO).

That gap was the machines needed to make the records.

Vinyl's popularity has taken off in the last four years or so, buoyed not so much by boomer-dad's music snobbery (although that still plays a role), but by a youthful taste for the format's warm analogue sound — much higher quality than the downloadable MP3s the younger generation grew up with.

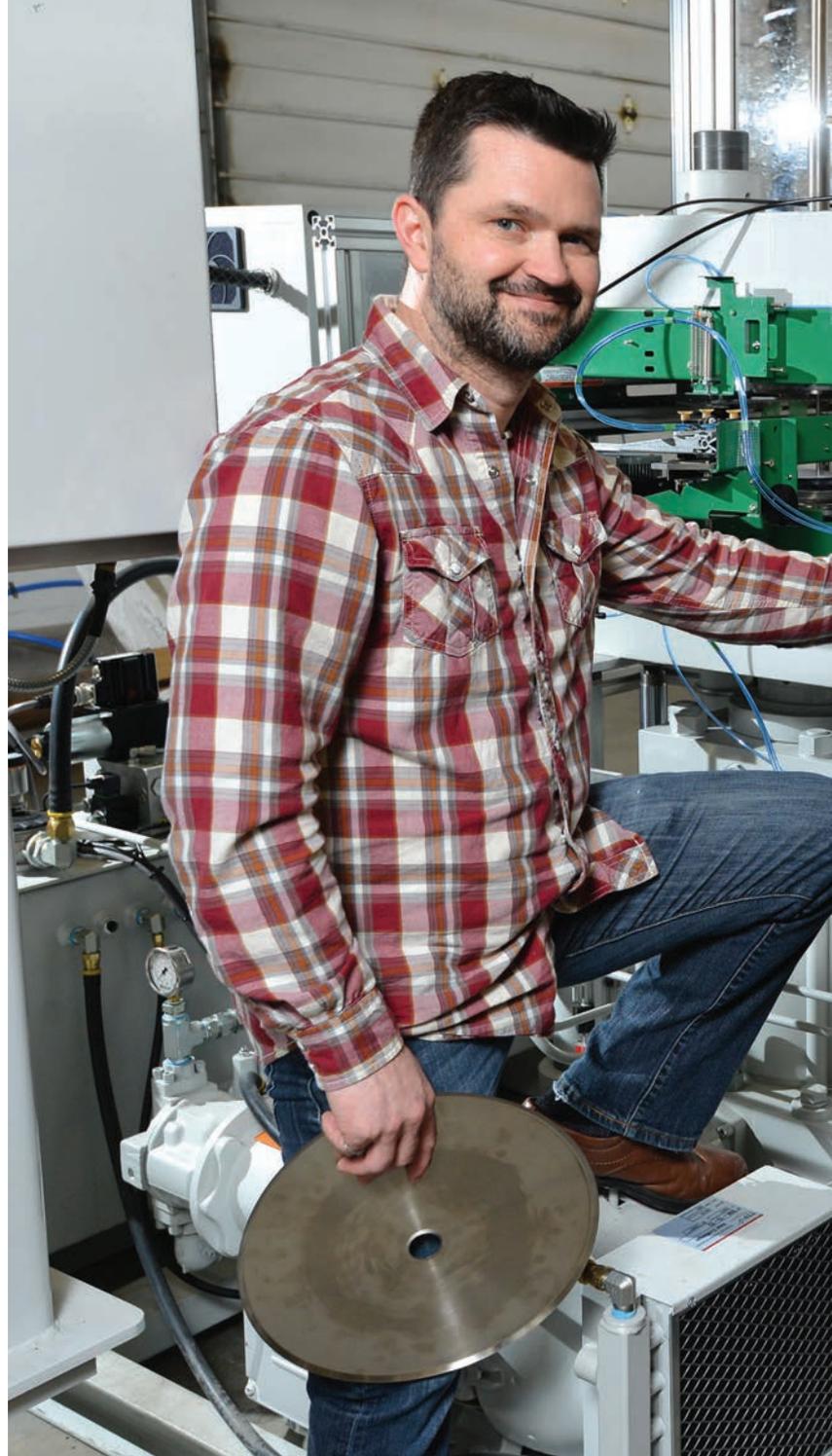
There's also the tangibility of the actual LP that's drawing in consumers. The music. The artwork. The liner notes. The format delivers a complete musical experience unlike those delivered by compressed audio files buried in your computer's hard drive.

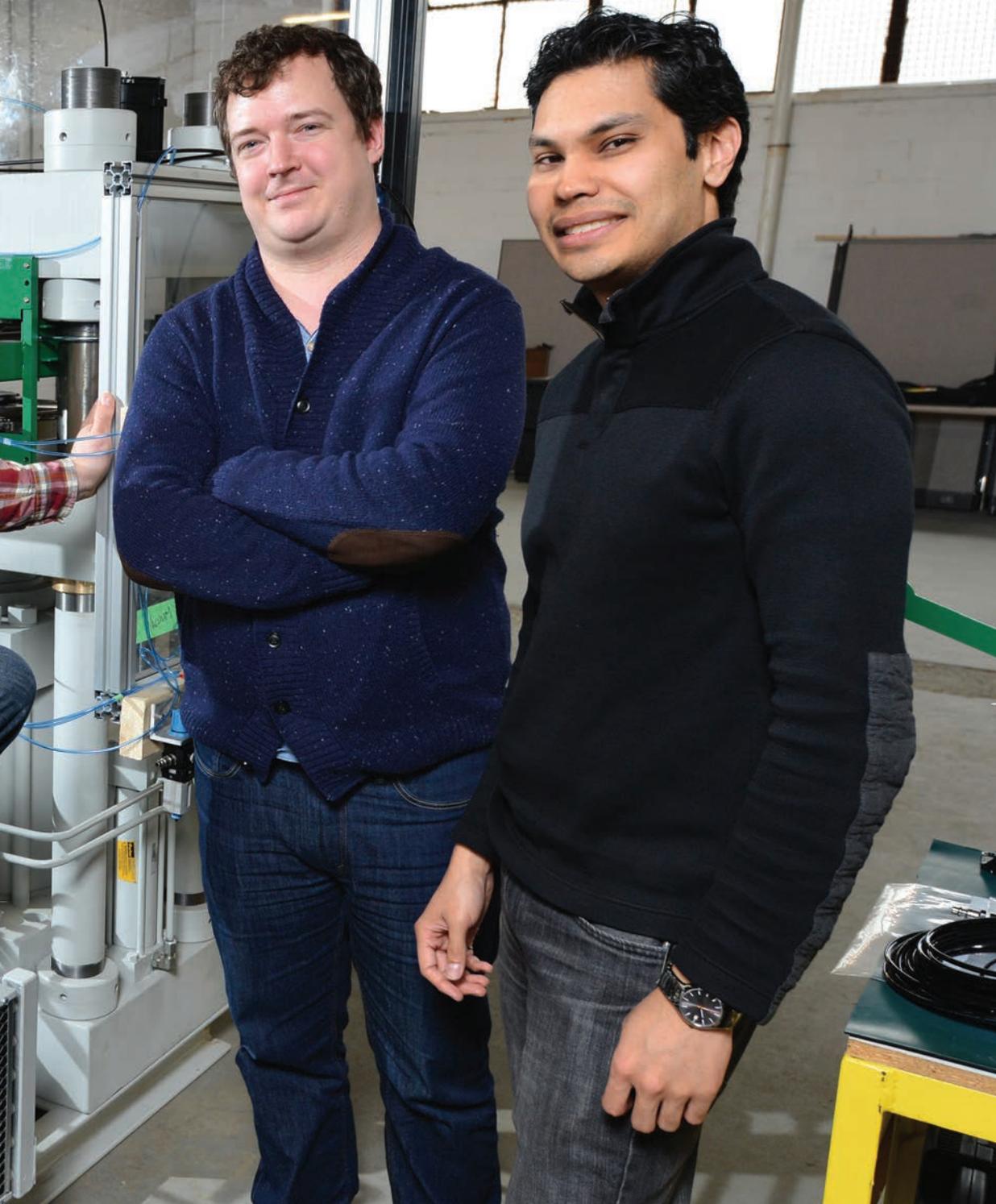
"Finding vinyl has become a hobby for a lot of people; they're going to record shops and digging around the shelves. LPs are a historical archive of music that just doesn't exist anymore," says Brown.

Vinyl is back in a big way. LP sales in Canada last year (517,400 units) were up 30% over 2014, according to Nielsen Music Canada. That's the biggest sales total since the SoundScan Era started in 1991.

In the US, a Recording Industry Association of America report revealed that vinyl music sales generated \$60 million more revenue than ad-supported streaming

(Left) PVC 'pucks' are squished onto silver-coated master negatives. (Middle) Viryl's automated press pumps out a vinyl record every 20 seconds, compared to an industry average of 28 seconds. (Right) CTO James Hashmi inspects Viryl's proprietary record stacking unit.





Vinyl founders (L-R) Rob Brown, chief operating officer; Chad Brown, chief executive officer; and James Hashmi, chief technology officer. PHOTO: RODNEY DAW

services in the first half of 2015, grossing \$221.8 million, a 52% year-over-year increase.

And it's not just the classic rock music LPs that are driving sales. This generation's artists are printing vinyl as an additional revenue stream. In fact, British songstress Adele's *25* was Canada's highest selling piece of vinyl in 2015, moving 6,200 copies followed closely by pop star Taylor Swift's 1989 at 6,000. The Beatles (*Abbey Road*) and Led Zeppelin (*Led Zeppelin IV*) are also among Canada's vinyl "Top 10," an homage to the format's zeal for popularizing classics in modern times.

Growing pains

"(MP3s) are an experience, but not the same experience as owning a vinyl record," says Hashmi, a University of Waterloo mechanical and mechatronic engineering graduate. "It's not as fulfilling as owning a piece of music. It's art, it's big, and it sounds great."

Vinyl's remarkable renaissance has experienced some growing pains.

The most pressing industry problem is the machines. They haven't been built in decades. In fact, Brown estimates the last company making machines went bankrupt in the 1980s when cassettes and CDs started to take hold in a marketplace that cranked the volume on convenience and portability.

The scarcity of presses has forced new record manufacturers, including Calgary's Canada Boy Vinyl and the now-defunct RIP-V in Montreal, to wrangle decades-old equipment from obscure sources and as far away as an abandoned barn in Germany, then bringing them back to life. There's also a supply and demand issue: the finite number of presses can't produce enough records to satisfy soaring demand, creating a bottleneck

Continued on page 14



MACHINERY

Continued from page 13

that's forcing artists and record labels to wait up to a year to press releases.

Viryl's goal is to eliminate the production bottlenecks. The company is backed by a \$1 million investment from a Burlington, Ont.-based machine tool manufacturer, where Viryl's presses will be manufactured once design and prototyping is complete.

R&D and engineering will remain at the company's Etobicoke warehouse.

The team of eight (plus an intern) are all engineers by trade. Both Browns, who aren't related, and Hashmi previously worked together at a medical device start up. When the company was sold, the three had the choice to move to the US or to join forces and start their own business.

Shortly after, Chad Brown was approached by a friend keen on having his engineer buddy build a machine that brought vinyl pressing into the 21st century.

"I texted him back and said 'no way,'" says Brown, who owned a Markham, Ont. record pressing plant, ACME Records, from 2003 to 2007. "I wanted nothing to do with vinyl. It was all old machines that are no fun to deal with."

But after the friend tapped the interest of a few investors from New York, he changed his tune and developed a CAD rendering of what a record press would look like if it was built in 2016; not a replica of presses from days past, but a machine packed with modern technology.

While the investors from New York eventually disappeared, Alf Zeuner, the CEO of AXYZ International, a global producer of CNC router, plasma and knifing tables, approached the team. Zeuner says he was looking to diversify his personal portfolio and was so impressed with Viryl's work, he injected \$1 million into the project to build a prototype and get the company off the ground.

Viryl's machine is meant to improve efficiency and provides pressing plants with the power



Michael Wybenga, director of hardware engineering, tinkers with a CAD drawing in Viryl's design shop.

PHOTO: RODNEY DAW

of data collection to fine-tune operations.

Brown concedes that older presses were also equipped with a certain level of automation, but it was typically a wired relay system that caused major disruptions when something went awry.

"You'd be pulling miles of wire out of the machine looking to find the right path when it broke down," says Brown, reminiscing about his days pressing vinyl at ACME.

VIRYL'S MACHINE IS MEANT TO IMPROVE EFFICIENCY AND PROVIDES PRESSING PLANTS WITH THE POWER OF DATA COLLECTION...

The machine at the Etobicoke warehouse spits out a vinyl LP every 20 seconds, compared to the industry average of 28 seconds, Brown says. Viryl has, however, been careful not to mess too much with the process of making records. Instead, modern automation and data analytics enhance the traditional process Hashmi admits still works well.

That process involves a "puck" ("since we're Canadian," says Brown), fitted with a label and squished by a ram under high pressure onto a silver coated, nickel-plated negative that presses the music onto the vinyl.

As flashing comes out, a grip-

per removes the LP and moves it to a cutting station where excess PVC is removed and finished records are placed onto a stacker for packaging.

What's different about Viryl is the company's A.D.A.P.T platform. The machines are equipped to pull data from every part of the process and feed a proprietary interface that allows manufacturers to monitor daily throughput, press uptime and identify, then address diagnostic

issues to keep the press running at peak performance.

"One of the major benefits is the ability to get production feedback and automate the process on its own to cut manual labour requirements and the amount of time someone actually needs to be monitoring the press," says Brown.

Growing pains

Viryl's machines will also provide producers with greater flexibility and allow shorter production runs with more customized products, such as coloured vinyl.

The company is currently testing a more environmental-

ly friendly calcium-stabilized PVC granulate over traditional lead- and tin-based versions that Brown hopes the entire pressing industry will eventually adopt. Viryl's hydraulic press has also been engineered to minimize flashing and reduce PVC waste, another green benefit.

Brown estimates the machines will take about 60 weeks of production to pay for themselves at \$195,000 a pop.

So far, demand is off the charts, and has the potential to blow an initial estimate of selling 25 machines a year out of the water. AXYZ's Burlington plant will have the capacity to produce two presses a week likely destined for customers around the world.

"I'm pretty sure someone in every country except Antarctica has contacted us about a machine," quips Brown, adding that most interest comes from the US and Europe.

Viryl hopes to have its prototype running soon. "If things keep going the way they are, this is going to be a very viable business for us."

Demand is there, it's now up to Viryl to satisfy it. For Brown, the opportunity is very real, and unique.

"I don't think any industry has ever come back from the dead."

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CYBER ATTACKS

Many network infiltrators gain access by duping unsuspecting staff into revealing information.

BY IMRAN AHMAD AND
KATHERINE THOMPSON

As manufacturers invest in cutting edge technology to protect their networks and digital assets from cyber attacks, hackers are targeting people instead of technology to gain unauthorized access to networks.

Cyber criminals are relying on social engineering and using various techniques (e-mails, telephone calls, impersonating other individuals) to manipulate employees into divulging sensitive information including usernames, passwords and credit card data.

Many of those targeted are aware they are disclosing information but fail to recognize its value and how providing it can seriously compromise the entire organization.

Easy access to personal information on social media platforms such as LinkedIn and Facebook allows hackers to research their targets (full name, birth date, job title, favourite activities or sites they visit) and use that information to gain their trust and confidence.

The most common tactics include:

- **Phishing.** The attack may come as an e-mail that appears to be sent by a legitimate business (bank, airline) requesting verification of information. The e-mail warns failure to take action will result in some dire consequence, such as the deactivation of an account or financial penalties, but clicking on the link gives the hacker access to the network or other sensitive information.

- **Pretexting.** The cyber criminal impersonates co-workers or other individuals, organizations or agencies (such as banks or police) who the victim perceives to have authority or right-to-know. Pretexting relies on an elaborate lie based on prior research and the use of this information for



Social media allows hackers to research their targets.

PHOTO: THINKSTOCK

Employees: the WEAK LINK

HOW HACKERS TARGET THEM TO BREACH YOUR COMPANY'S NETWORK SECURITY

impersonation (date of birth, social insurance number, last bill amount) to establish legitimacy.

- **Baiting.** This technique follows the mechanics of phishing but a criminal will promise the victim an item or reward in exchange for certain information, such as log-in credentials.

- **Tailgating.** Hackers will usually target small to mid-size businesses that lack robust security measures (key card access) and will pretend to be an employee (or a new employee). A cyber criminal may impersonate a janitor, gain entrance to the premises and access confidential information or steal documents.

What steps can your company take to ensure employees are ready to meet this threat? Here are three defences that are quickly implemented:

- **Training.** Have specific policies in place that assume your employees will be targeted. Include specific rules for e-mails, web browsing, mobile devices and social networks.

- **Regular refreshers.** Training is not a one-time event. Have regular, focused sessions with employees about different types of social engineering techniques. Organizations with regular employee churn should conduct more frequent refreshers and training sessions.

- **Testing.** Training and refreshers are great but how do you know employees are prepared? Consider retaining a third party to test staff with table top exercises and/or unannounced penetration exercises.

Educating employees on the technological, social and psycho-

logical aspects of social engineering establishes an integrated defence consisting of knowledgeable staff, up-to-date cyber security policies and frameworks, and effective incident response protocols.

Imran Ahmad, a lawyer at the Toronto law firm Cassels Brock & Blackwell LLP and member of the firm's privacy group, develops and implements strategies related to cyber threats and data breaches. Follow him on Twitter: @imranvpf or e-mail iahmad@casselsbrock.com. Katherine Thompson is the chair of the Canadian Advanced Technologies Alliance's Cyber Council. E-mail kthompson@cata.ca.

Comments?
E-mail jterrett@plant.ca.

TYRANNY

of the IMMEDIATE

HOW TO AVOID IT AND EXPAND GLOBALLY IN FIVE STEPS



Make your business a Canadian world leader.

PHOTO: THINKSTOCK

Getting caught in a decision-action trap leads to poor decisions, insufficient planning and ineffective execution.

BY MITCHELL OSAK

These days, there's no shortage of economists and politicians exhorting Canadian manufacturers to go global. The reasons are well known. GDP growth is slowing significantly according to the latest OECD outlook, while low cost foreign producers have invaded Canada's markets. Furthermore, our domestic market is small, resource-driven and relatively fragmented.

A number of high-profile success stories

such as MacDonald Dettwiler and Associates, Canada Goose, Bombardier and Lululemon prove that Canadian companies can design and build world-beating products. The \$64,000 question is: how can your business become one of those world leaders?

While there is no single, winning roadmap to successful international expansion, a lot can be gleaned from the stories and best practices of the Canadian manufacturers that blazed this trail before you.

One such best practice – and one that seems to be adopted by successful global manufacturers – is the ability to overcome the 'tyranny of the immediate' in strategy development and planning.

This decision-making construct is the tendency to allow the crisis of the day, or big,

shiny opportunities, to drive poor decisions, insufficient planning and ineffective execution.

Management exuberance, a lack of patience or missing information are at the core of this decision-action trap. Examples include: focusing on deals or tactics instead of more fundamental strategic concerns (how you will compete); being assumption-driven rather than fact-driven; adopting a short-term planning horizon; and using a Western-based analytical lens when examining other cultures and markets.

Fortunately, there are many ways to avoid these pitfalls and maximize your return on investment:

- 1. Avoid hubris.** Success has a habit of cultivating a dangerous level of pride and arrogance in many companies. When looking at international expansion, manufacturers may be inclined to rely too much on their judgment and cut analytical corners, underestimate the time or financial investment involved or take unnecessary risks. These blind spots and biases are dangerous. Success in certain markets does not always or easily translate into strong results elsewhere. Consumers and channels, even within the same country, can be very different; there is no substitute for caution when entering new geographies. To ensure the evaluation is objective, develop an independent, fact-driven market entry business case that includes learning from the successes and failures of similar companies, and delivers a 'danger check' around financial and operating plans.

- 2. Find your white space.** Competing with a me-too product in a familiar home market is challenging enough, but it's a recipe for disaster in a foreign market when your entry brings nothing new or compelling to the existing category. When expanding overseas, be realistic about a product's appeal. Typically, you'll be entering highly competitive markets populated with a decent selection of incumbent products. Local players may not be as sophisticated as you, but they'll likely be aggressive and territorial. To gain market share, find the market 'white space' or a way to differentiate with a relevant and credible product, or an innovative approach

Continued on page 18

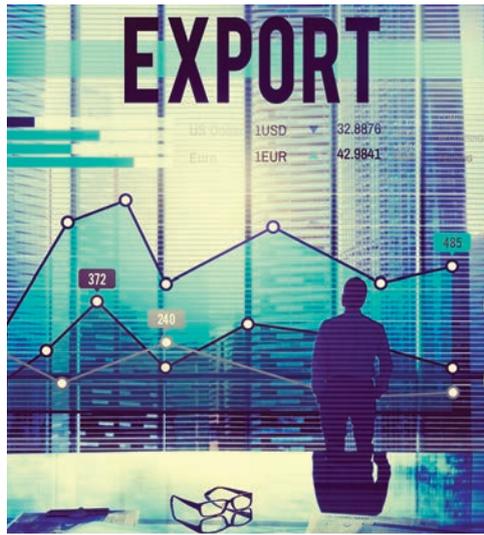
EXPORTING

Continued from page 17

to getting to market. In one case, a Canadian B2B manufacturer penetrated the crowded US market by developing a new e-commerce channel that reached customers by outflanking traditional 'bricks and mortar' selling by competitors.

3. Drill deeper. A company needs to understand its new target market – specifically the clients, channels, competition and regulatory requirements. Often this analysis doesn't tell you enough to best capitalize on opportunities and minimize risk. Prudent business leaders probe further, to really understand what makes the country and its people tick. Include a deeper understanding of the target country's geopolitical position and history; its people's political and cultural views towards Canada; and key environmental risks. As an example, it's no secret that Japan experiences earthquakes. The potential impact on your business is an important consideration. The devastating 2011 quake wreaked havoc on the national economy, not just the hard-hit northeast region. For months after the disaster, fuel shortages continued nationwide and power outages negatively impacted production, distribution and the ability of staff to get to work.

4. Leverage your home team advantage. There's no substitute for being on the ground with your own personnel or hooking up with credible local partners. However, this approach can be expensive and time-consuming.



Expand into global markets.

PHOTO: THINKSTOCK

ing. A more practical solution lies in enlisting the knowledge, connections and talent found in your own backyard. Hundreds of thousands of new Canadians hail from large emerging markets such as India, China, Russia and Brazil, not to mention more mature markets such as the US, Great Britain and France. These people possess vital market knowledge, networks and assets that could smooth and accelerate your global expansion, especially in harder-to-crack, large emerging economies.

5. Be realistic. If a huge market beckons, by all means, dive in – but be realistic. Rome wasn't the only place not built in a

day. Despite your best efforts, the roll out will inevitably be lengthy – and positive financial results will likely come slower than expected. The pace of business in many places, especially in emerging markets, can be excruciatingly slow. The delays come in all flavours: slow regulatory approvals, customer purchase inertia and unavoidable challenges such as physical distances, border controls and time differences. In our research, many rapidly growing African, South American and Asian markets still lack even the basic financial, physical and legal infrastructure to which Canadians are accustomed. Success could be measured in years, not months.

International expansion should be a strategic imperative for many domestically focused manufacturers, but there are no easy markets or silver bullet strategies to increasing your global footprint. Fortunately, companies can improve their odds of success by leveraging the experiences of others by doing their analytical homework, having realistic implementation expectations and being innovative in terms of how they enter and compete in a target market.

Mitchell Osak is managing director, strategic advisory services, at Grant Thornton LLP, a Canadian accounting, tax and advisory firm. E-mail mitchell.osak@ca.gt.com. Visit www.grantthornton.ca.

Comments? E-mail jterrett@plant.ca.

TRAINING

Welcoming new employees

Don't forget the administrative basics

BY HUGH ALLEY

The first few days for a new employee can be confusing. There's so much to learn, but some companies provide a checklist to help the orientation process along. It covers building access codes, computer login, safety orientation, payroll, benefits and other details.

However, the following administrative basics of doing the job are often glossed over:

- how to carry out key ERP-related functions
- file structure and file naming conventions
- security practices (computer and physical)
- where documents and forms are kept
- e-mail protocols
- CRM practices to track customer conversations

When these matters aren't explicitly addressed, odds are the new people will guess, and they'll make mistakes. Nothing like spending time (and money) trying to find a document that was stored in the wrong folder, or sorting out a production error because the operator didn't know where to find the answer to a question.



Cover the administrative details of a new hire's job up front.

PHOTO: THINKSTOCK

Train new employees on the administrative details of their jobs from the beginning. It takes much less time than what's wasted dealing with their mistakes.

Hugh Alley is a Burnaby, BC-based consultant who helps companies achieve significant performance gains in a short timeframe. Contact (604) 866-1502 or e-mail halley@firstlinetraining.ca.

THE LAW

An alcohol and drug policy must be broad enough to address impairment from illegal, medical and recreational drug use.

BY ANDREW EBEJER

During the 2015 federal election, Justin Trudeau promised marijuana would be legalized, but as we stand today, marijuana possession without a prescription is illegal.

Legal or not, the worry for employers remains the same: how to manage the use of marijuana in the workplace, particularly in manufacturing where employees operate heavy and automated machinery, and impairment can have fatal consequences.

Relying on drug testing may seem appealing; however, testing is only permitted in limited circumstances and results are inconsistent. Other controls, such as policies and protocols, should be considered.

The primary purpose of testing is to indicate the presence and extent of an employee's impairment on the job. With rare exception, existing testing methods do not indicate current impairment. They do show a drug is present in the body, including what may be a trace amount from several days or weeks prior, that has no impairing effect. Balanced against the potential privacy implications of compelling an employee to provide a personal sample (of blood, urine, saliva, breath) courts and arbitrators have taken a cautious approach to permitting workplace drug testing.

Consider these scenarios:

- **Pre-employment and pre-access.** In Ontario, courts and arbitrators have held that this type of testing is not permitted because it neither demonstrates impairment in the workplace (testing occurs before work), nor predicts future impairment.

- **Random.** Testing and privacy issues make random testing



An employer accommodating medical marijuana use must carry out health and safety due diligence.

PHOTO: FOTOLIA

WEED and the WORKPLACE

MANAGING THE LEGAL AND SAFETY ISSUES

permissible only in very rare circumstances. In a unionized environment, an employer must demonstrate the workplace is dangerous and there's evidence of a drug problem. In a non-unionized workplace, Ontario courts have permitted random alcohol testing where: an employee works in a safety-sensitive position, and workplace supervision is non-existent or minimal.

- **Post-incident and reasonable cause.** If there is reasonable basis to suspect substance abuse may have been a factor in a workplace accident or "near miss", an employer may test the employees involved; and where actions suggest impairment (slurred speech and/or the smell of marijuana). Testing in both of these contexts is generally permissible provided the workplace has appropriate policies in place identifying the circumstances in which testing may occur.

- **Return to work.** Following treatment for drug dependency, such testing is typically part of a

return to work program or a condition of a last chance agreement stipulating that a positive test will result in termination.

Safety precautions

When marijuana is used to treat a medical condition such as epilepsy, chronic pain or post-traumatic stress disorder, an employer has a duty under human rights legislation to accommodate the employee and during working hours if it's medically necessary to do so, unless the accommodation would result in undue hardship for the employer.

However, an employer may still implement workplace rules regarding the use of medical marijuana. This may include exploring alternatives such as ingesting it or smoking in a designated area during scheduled breaks or meal periods; and restricting the employee from smoking while in uniform, in public view, in a company vehicle or in the vicinity of others who may come into contact with the smoke.

Under Ontario's Occupational Health and Safety Act (OHSA) an employer has an obligation to take every reasonable precaution to protect the health and safety of workers. This includes identifying hazards that may result from an employee working while under the influence of medical marijuana. A safety-sensitive position may mean re-assigning the employee to a non-safety-sensitive position.

A drug and alcohol policy must be broad enough to cover impairment from the use of illegal, prescription and legal recreational drugs. At minimum it should:

- Prohibit an employee in a safety-sensitive position from working while impaired.
- Require an employee to disclose information about any drug use that may impair his or her ability to perform work safely.
- Set out a process to obtain information regarding drug use in a way that respects privacy and encourages compliance.
- Set out a process for obtaining additional medical information to facilitate accommodation.
- Ensure the employee (and union if applicable) participates in the accommodation process.
- Identify restrictions on the use of marijuana in the workplace.
- Identify consequences in the event of a breach of the policy.

Having a policy puts employers in a better position to manage risks resulting from an anticipated increase in employee use of marijuana, whether it's for medical or recreational reasons.

Andrew Ebejer is a lawyer with Sherrard Kuzz LLP in Toronto, an employment and labour law firm representing management. Call (416) 603-0700 or e-mail aebeker@sherrardkuzz.com. Visit www.sherrardkuzz.com.

Comments?

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THINK LEAN

All kinds of problems require quick resolution, and some tools are more effective than others.

BY RICHARD KUNST

There is a suite of lean tools and methodologies that can be used to identify and eliminate waste but many organizations fixate on just one formal problem solving methodology. The better plan is to apply tools that complement each other.

The goal is to identify, train and implement a practical, operations-level tool that's simple, robust and generic.

The tool must be instinctive for use by all factions of the operation; effective for processes, set-up issues, system, tooling, operating systems, ISO violations and new product launches; resolve chronic problems; be timely in resolution weeks versus months; reduce scrap and rework; and reduce operating system violations.

There are various problem-solving methodologies.

The Kepner-Tregoe (KT) approach is a thorough fact finding and information organizing process that points to the root cause of special cause problems. It's most effective when a condition is acceptable, then unacceptable. It covers these points:

- A specific framework is used to follow from problem definition to confirmation of the root cause.
- Problem description asks specific questions to define what the problem is or is not to get a clear understanding of the issue. These facts validate the potential root causes through evaluation of distinctions and changes.
- Potential causes are measured against known facts. The root cause must adequately explain observable facts. Most likely causes are then validated and corrective measures taken.
- Problem solving and decision making (PSDM) can be installed through a Train the Trainer approach that uses case studies and action learning. It ensures



Make the best use of the lean toolbox by combining methodologies. PHOTO: THINKSTOCK

Problems, problems, PROBLEMS...

WHAT'S IN THE TOOLBOX TO FIX THEM

the cost is minimized without compromising the integrity of the training.

Desired outcomes

KT allows an organization to speak the same language about problem solving, and look at problems analytically without jumping to conclusions. It ensures the cause is identified and any implementations consider potential side effects prior to launching, so contingency plans can be developed to protect the desired outcomes.

The 5 Whys is a technique that doesn't involve data segmentation, hypothesis testing, regression or other advanced statistical tools, and in many cases it's completed without a data collection plan. By asking 'Why' at least five

times, you peel away the layers of symptoms that lead to the root cause of a problem.

Suppose you received a large number of customer returns for a particular product.

1. Why are the customers returning the product?

Ninety per cent of the returns are for dents in the control panel.

2. Why are there dents in the control panel?

The control panels are inspected as part of the shipping process, thus, they must be damaged during shipping.

3. Why are they damaged in shipment?

Because they're not packed

according to the packaging specification.

4. Why are they not being packed according to the packaging spec?

Because shipping does not have the packaging spec.

5. Why doesn't shipping have the packaging spec?

Because it's not part of the normal product release process to furnish shipping with any specifications.

Using the five whys reveals that a flaw in the product release process results in customers returning a product.

Toyota A3 Shainin (statistical engineering) applies the SWAT

Continued on page 22



Is your business growing faster than your warehouse?

Imagine flexible warehousing that grows with your needs, and where you only pay for what you use. What if you could achieve greater control over your inventory with impressive order-fulfillment capabilities and an integrated returns management system, all in real time? Picture an end-to-end solution that's easier, improves your speed to market, and best of all, delivers an experience your customers expect. With Canada's leading integrated freight, package and supply chain solutions provider, it's possible.

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THINK LEAN

Continued from page 20

Team approach, a small highly focused unit actively engaged in finding a solution to a particular problem in two stages: the diagnostic and remedial journeys.

The diagnostic journey begins with an effective measurement system to assess the output variable (Green Y) that defines the problem, using a tool called an ISOPLOT.

A Solution Tree defines the families of variation present in the problem and expands them to include how potential causes could influence variation observed in the product.

Clue generation tools such as Multi-Vary expose the nature of the variation (how it manifests itself over time). It involves the measurement of a specific quantity of parts in a specific manner, at a specific time interval to determine which family of variation is dominant.

Diagnostic journey

A designed experiment determines the effect of potential causes of variation on the Green Y and applies the Pareto principle, which states a particular problem has a primary contributor or Red X. Lesser variables that have a measurable effect are termed Pink X, Pale Pink X. These are not ignored but considered subordinate to the Red X. Once Red X is found, the diagnostic journey ends and the remedial journey begins.

The remedial journey applies a designed experiment to construct a tolerance parallelogram for the Red X. This defines allowable limits the Red X can run within to ensure the Green Y remains in control. It secures the gains with pre-control methodology to lock in the Red X variable and prevent the problem from recurring. And it looks beyond the fix to other systems or parts that could benefit from this new knowledge.

The levels of process capability is based on how any project will reduce variation within any process to less than four mistakes per million process outputs.

Projects are submitted for

senior management review and approval. All projects must have a direct positive effect on the bottom line with a usual cost reduction of greater than \$250,000.

THE GOAL IS TO IDENTIFY, TRAIN AND IMPLEMENT A PRACTICAL, OPERATIONS-LEVEL TOOL THAT'S SIMPLE, ROBUST AND GENERIC. . . .

The tools are a combination of quality, engineering and statistics that have been used by manufacturers over the last 100 years.

Common terms in a Six Sigma organization are:

- **Master Black Belt.** The person who has successfully led Six Sigma teams on process variation reduction projects, extensive knowledge and is proficient in use of Six Sigma tools. Teams consult this individual on project clarification.

- **Black Belt.** This person is trained in the use of the tools

and leads project teams through the define, measure, analyze, improve and control phases.

- **Green Belts.** These project team members gather and analyze data, develop improvement

methods and apply Six Sigma tools within the context of their own jobs.

Triz is a Russian acronym for The Theory of Inventive Problem Solving. The process was developed through analysis of more than over 1.5 million patents and determining the engineering principles that led to the invention.

A Triz practitioner tackles problems that have no known solution. There are numerous laws and hypothesis developed by Triz and extensive training is required to understand their use.

There is a wide array of formal problem-solving tools to learn. Co-mingling many of them will allow for a problem to be escalated until it becomes resolved permanently. For example, you can use an A3 to resolve a special cause problem or use it to frame what the problem may be. If the problem is not resolved, the output can become inputs for Kepner Tregoe problem solving. If this still doesn't resolve the problem because more data is required, it becomes a good candidate for Six Sigma.

Richard Kunst is president and CEO of Cambridge, Ont.-based Kunst Solutions Corp., which helps companies become more agile, develop evolutionary management and implement lean solutions. Visit www.kunst-solutions.com. E-mail rkunst@kunstofsolutions.com.

Comments?

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ENERGY

Teknion plugs into Ecogate

Dust collection system delivers major savings in less than a year

Teknion is saving big on energy at its Tekwood wood division plant in Toronto where it manufactures workplace furniture and office systems.

Installation of a dust collection system from Ecogate, a supplier of energy saving systems for the wood industry (among others) based in North Hollywood, Calif., racked up 60% savings. It achieved projected results in less than one year with the replacement of the old system, which ran for 18 hours, five days a week and was the biggest energy consumer at the plant.

Tekwood contracted SyENERGY Integrated Energy Solutions to install the Ecogate system at the 6,225 square-metre facility, which operates five days a week and employs around 100 people. It was operational in January 2014.

The system is completely automated with sensors and 26 motorized gates. When one of the 20 machine centres is turned on, a sensor sends a signal to open the appropriate gates, adjusting the velocity in the ducting to match the new demand. The gate closes and the dust collector fan speed slows again when machines are turned off. Power supplied to the fan is optimized through a variable speed drive.

Combining the two dust collectors drops the average



Each machine at the Tekwood plant is equipped with a motorized Ecogate blast gate.

PHOTO: TEKNION

fan electrical load from 280 to 114 kilowatts, and the noise level has decreased substantially. Teknion has seen drastic savings in electricity and continues to project energy savings of around 60% on dust collection, which translates into \$90,000 per year.

A few years ago a major lighting retrofit was done, replacing T-12 with T-8 lamps. Also, the wood drying process has been made more efficient by using UV light and water-based stains.

A compressor upgrade is planned, and thanks to the Ecogate system's positive results at Tekwood, the same system will be implemented at two other Teknion sites.

Source: Natural Resources Canada



ECM CEO Fadi Emeid and the 1,100 square-foot E-house destined for Enersource in Mississauga, Ont.

PHOTO: ECM

Advanced manufacturing technology and a lot of engineering expertise went into this 1,100 square-foot, single-welded unit.

BY PLANT STAFF

Elias Custom Metal Fabrication (ECM) Ltd. has come a long way since it's humble beginning in 1994 when founders Fadi and Sam Emeid opened the doors of their 4,300 square-foot, two-man shop.

The brothers started with simple shearing, punching and several welding machines, but over the ensuing years have invested in advanced manufacturing technologies and staffed up with skilled workers. Now the company occupies an 80,000-square-foot facility in Vaughan, Ont., employs more than 40 staff, and has unveiled what it describes as the first of its type, fabricated-in-Ontario, custom-designed E-house, which is going to energy provider Enersource in Mississauga, Ont.

"Previously, Canadian companies had to purchase E-houses from abroad. Now ECM has brought the capacity and skilled knowledge home [for such E-houses] be manufactured here in Ontario," said Fadi Emeid,

Welcome to the big E-HOUSE

ECM FABRICATES FIRST OF ITS TYPE IN ONTARIO

ECM's president and CEO.

E-houses, alternatives to concrete block or brick structures, are prefabricated, walk-in and usually modular outdoor enclosures requiring assembly on site that house medium and low voltage switchgears and auxiliary equipment. ECM's E-house is prebuilt, tested and ready for installation on site.

The utility grade electrical house was engineered using 50% recycled materials in partnership with ABB Canada, which engineered the structure and hired ECM to build it.

To be clear, this isn't just any E-house. ECM's creation is the size of a suburban bungalow at 1,100-square-feet, and the single-weld unit, made for the power, mining and oil and gas industries, is the largest allow-

able under Canadian transportation rules. The unit will be loaded by crane unto a flatbed and escorted by police to ABB in Brampton, Ont. When fully equipped by ABB, it will weigh 130,000 pounds.

Attending to details

Emeid says it took 12 engineers and metal fabricators to bring it all together in under three months, one month alone to detail the whole unit working with 140 parts and assembly drawings.

The E-house has several characteristics that Emeid says makes it a first. Its a type 3R enclosure, custom designed and manufactured to hold electrical equipment as per CSA C22.2 No.94.1 specifications for use in a nonpublic place; the 56-foot unit is 13 feet high and 17 feet

wide, welded and assembled as one piece; the arc-proof doors are custom designed, tested and certified; the base and walls are manufactured from structural steel tubes and I-beams welded together with a 1/4-in. floor; and the inside/outside walls and roof are 14 & 16 GA galvanized mild steel, powder coated.

"You need talent and expertise, you need advanced manufacturing equipment, and you need certifications," says Emeid. "We have a lot under one roof. There isn't anyone else who can build that without having all of three things together."

ECM's certifications include ISO 9001:2008, CWB, CSA W47.1/W47.2, plus compliance for electrical enclosures and fusion welding, and UL listing.

The company makes regular investments in advanced technology. The latest is \$2-million for advanced Trumpf laser equipment that will add capacity for more complex projects involving laser tube construction and automated welding, which could translate into 10 new skilled jobs.

ECM is targeting North America for this type of E-house, but there is also potential for other export markets.

Comments?

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MAINTENANCE

Adopting a comprehensive M&RR plan will drive efficiency and project performance.

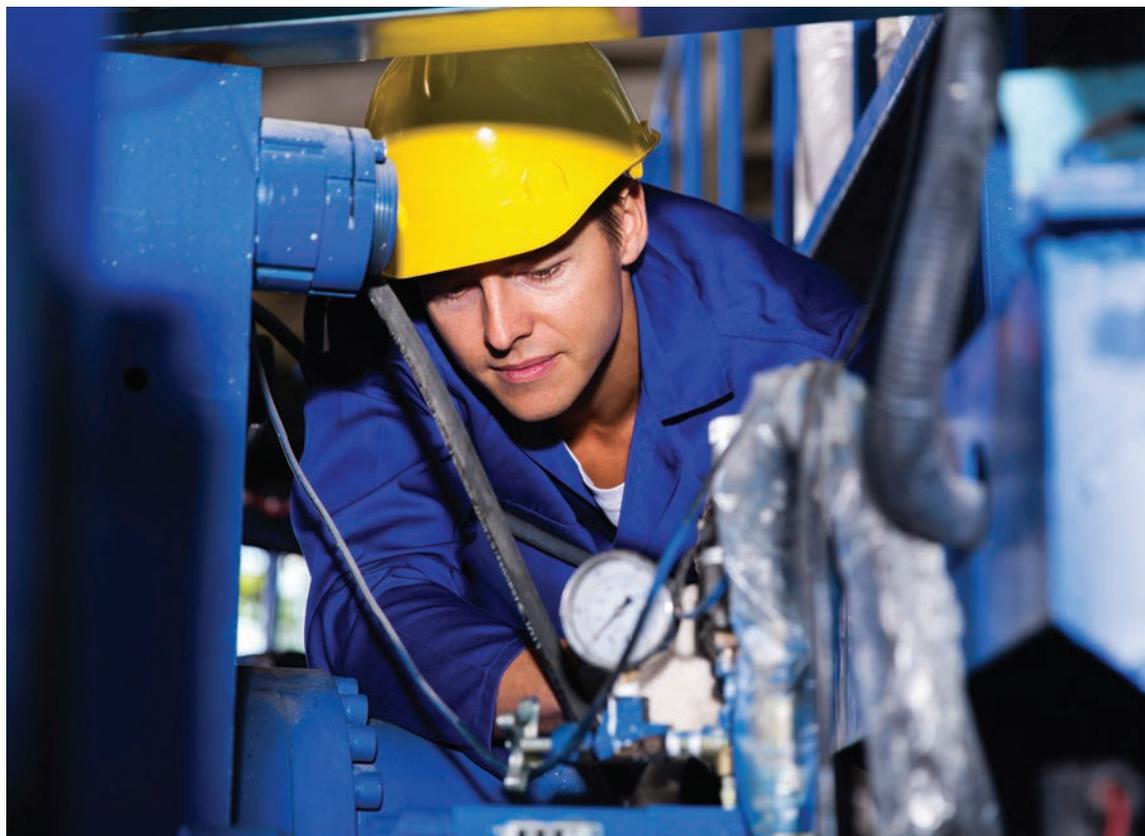
Company executives want to see a business case for implementing a comprehensive maintenance and reliability readiness (M&RR) plan for specific capital projects, but it can be a difficult thing for maintenance pros to do.

Many plans don't consider the value destruction that occurs in most capital projects. Common causes include the cost of buying an excessive amount of new spare parts; reduced or intermittent production during the ramp-up phase; and much higher annual maintenance expenses.

Murray Macza, the market development manager of Emerson Process Management (EPM) in Sandy Hook, Conn., addressed this issue at a MainTrain conference hosted by the Plant Engineering and Maintenance Association of Canada (PEMAC).

Macza, also the leader of the Management Resources Group Inc., a division of EPM and a reliability consulting business in Western Canada, enumerated the challenges and problems associated with new capital projects. They include: little or no input into the design from operations and maintenance; tons of data, but what's really relevant?; the EAM system isn't loaded with asset or spare parts master data or maintenance procedures; plant downtime is usually very high in the first year; and the "to be" state for new assets needs to be aligned with PAS 55, API 691 and ISO 55000 requirements, but often isn't.

On the plus side, Macza noted numerous benefits – reduced maintenance expenditures; a reduction of new spare parts inventory; energy savings due to fewer steam, gas or air leaks; smoother-running equipment; increased asset availability; fewer failures and stoppages; improved product quality through reduc-



Your M&RR plan should address operational risks from the early stages of project evaluation.

PHOTO: THINKSTOCK

Add VALUE to CAPITAL projects

MAKE A CASE FOR A MAINTENANCE AND RELIABILITY READINESS PLAN

tion in scrap and rejects; less rework; and fewer shutdowns and start-ups.

New projects

An M&RR plan addresses operational risks from the early stages of project execution; develops mitigation activities; prepares new capital projects to be efficiently operated; and delivers optimal performance. It must be customized to fit the unique needs of each project, and it must be integrated with the project's engineering team, says Macza.

The *Capital Projects Operational Readiness and Risks* white paper (Storino, Bruno, 2012) emphasizes the importance of adhering to a logical se-

quence of front-end engineering, followed by detailed engineering design, construction and commissioning start-up.

The key terms to understand when contemplating new capital projects are:

- capital budgeting – allocation, cash for analysis
- hurdle rates – minimum rate of return on the project
- discount rates – internal rate of return
- net present value – sum of the present values of cash flows of the project over a defined time horizon
- capital cost – the amount of money that equals replacement asset value (the cost that would be incurred to replace

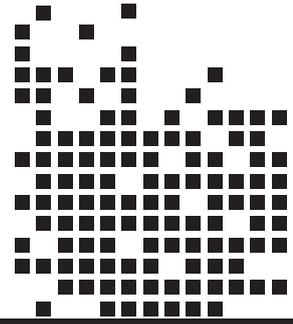
the equipment in its current configuration, based on current replacement prices).

Making a case for an M&RR plan requires an understanding that the key drivers are the pursuit of operations excellence and capital markets sensitivity, awareness of lost value that can be avoided by adopting a comprehensive plan, and by defining the financial opportunity; the benefits-to-cost ratio; and the rate of return on the investment.

The M&RR is still a relatively new concept so executive buy-in and sponsorship is critical.

– Steve Gahbauer

Comments?
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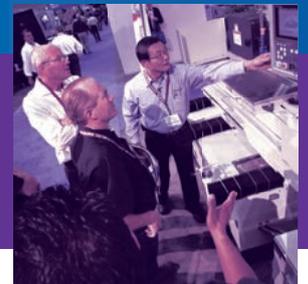
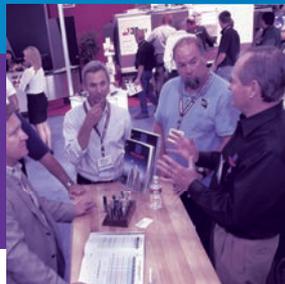
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Emissions allowances will top out at 142 tonnes when the program starts in 2017.

BY PLANT STAFF

The Ontario Liberal government is moving forward with its cap and trade program to limit greenhouse gas emissions and reward “innovative” clean tech companies. It hopes doing so will generate investment and create jobs as the province moves to a lower-carbon economy.

Details of the contentious program, which has been called a “tax on everything” by political and industry opponents, is available in detail to the public and it’s on the Environmental and Regulatory registry for a 45-day period, allowing public and stakeholders to comment.

Here are some general points manufacturers should be aware of:

- The bill is expected to increase the price of gas and natural gas bills, while giving some of the province’s largest polluters a four-year “holiday.”

- Legislation for the Climate Change Mitigation and Low-carbon Economy Act, if passed, would require all proceeds from the cap and trade program to be deposited into a new Greenhouse Gas Reduction Account.

- Every dollar from the account is supposed to be invested in green projects that reduce pollution and save energy for homeowners and business, such as public transit, cleantech innovation, electric vehicle incentives and social housing retrofits.

- The Liberal government expects to generate up to \$1.9 billion per year from the program. Ontario’s goal is to reduce carbon emissions 80% below 1990 levels by 2050. It has set two mid-term targets to measure progress: 15% below 1990 levels by 2020 and 37% below 1990 levels by 2030.

- The price on carbon has been set at \$18 a tonne and caps emissions allowances at about 142 tonnes per year by 2017, when cap and trade is rolled out.



Proceeds from the program are to be deposited in the province’s Green Gas Reduction Account.

PHOTO: THINKSTOCK

CAP and TRADE unveiled

ONTARIO SETS ITS PRICE ON CARBON

- The cap is expected to decline 4.17% each year to 2020, when the Liberals hope to have achieved a 15% reduction in greenhouse gas emissions over 1990 levels.

- Heavy polluters including Es-sar Algoma Inc., Vale Canada Ltd. and Imperial Oil will receive free allocations, which the province claims is meant to protect jobs in industries competing with jurisdictions without a carbon pricing system. The exclusions are also meant to recognize industries that have made efforts to reduce emissions, but need more time to invest in new technology.

- Non-compliance could result in fines ranging from \$25,000 to \$10 million, and prison sentences up to five years for individuals.

An initial compliance period will incorporate temporary measures to smooth the transition.

- Only registered participants will be allowed to purchase, sell, trade or deal in the Ontario allowances and credits. The province expects the first carbon auction to take place in early 2017.

The program is based on California’s cap and trade program, which is said to have grown at a pace exceeding national US economic growth after it was put in place. Job creation ballooned by almost 3.3% in the first year and a half, outstripping the national job creation rate of 2.5% over the same period.

A note of warning about imposing regulations, carbon taxes or cap and trade regime came

from Canadian Manufacturers & Exporters in a letter to Prime Minister Justin Trudeau as he was about to meet with the premiers about a national approach for climate change.

President and CEO Jayson Myers wrote that such options will not be effective without measures that encourage capital investment. In fact, he said they could cause a lot of damage by diverting money that would otherwise be invested in new technologies by consumers or industry to government revenues; or to “high risk technology unicorns with little chance of commercial success or widespread adoption here in Canada.”

Comments?
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PROSPERITY begins

HIGHLIGHTS FROM PLANT IN THE 1950s

75 YEARS

With soldiers home from the war and starting families, Canada began a long period of industrial prosperity.

BY JOE TERRETT, EDITOR

With World War Two five years in the past, Canadian industrialization was taking off by the beginning of the 1950s. Indeed, the *Canadian Encyclopedia* notes it was largely responsible for the longest period of sustained economic prosperity that occurred between 1945 and 1970. Much of the postwar growth was fuelled by American investment and consumption. This brought about changes in the workforce and labour relations, which *PLANT Administration* often discussed throughout the decade. Many of these issues bedevil manufacturers today.

First some context.

In 1946, there were 1,214,000 workers employed in manufacturing, according to Statistics Canada. By 1950 the number had risen to 1,316,000 and by 1959, the total was 1,494,000.

Soldiers were part of a growing workforce and were doing their part to fuel industrial growth. Baby boomers (now on the retirement track) started arriving and over a 25-year period, the Canadian boom produced about 1.5 million more births (of a 8.6 million total) than would otherwise have occurred, an increase of more than 18%.

The Canadian Science and Technology Museum reports the 1950s promised new social and technological developments. People were driving car, household goods and appliance sales as they bought into



Forging steel in the 1950s. PHOTO: THINKSTOCK

home ownership.

Workers were also forming and joining unions, which fought for and won better wages and more vacation time.

Statistics Canada's *Canadian Social Trends* report shows membership in Canadian unions nearly quadrupling between 1940 and 1956, a result of legislation that recognized labour organizations and enforced collective bargaining agreements. The Rand formula provided financial security to unions by requiring all workers in a bargaining unit pay dues, whether or not they were members.

Labour issues

In a 1950 issue, *PLANT Administration* identified the classic labour/management conundrum. Business thinks labour needs better leaders, while labour says there's a need for better business leaders. Office workers were beginning to compare their lot with their production brethren, and Eric Taylor, an assistant manager in the industrial relations department of Canadian Industries had this to say: "A leader maintains his privilege of being a

about 3%. The article observed this cost-price squeeze cut into profits.

Some industries were not in a position to pass along the higher prices to consumers. Appliance and TV manufacturers in particular were caught in the squeeze because "the competition is tough."

The solution? Improving productivity.

In 1959, a *PLANT Administration* editorial wondered if Canadian and US manufacturers, faced with spiralling costs, were importing goods from lower wage countries rather than making them at home.

A Canadian visiting a US plant learned the company had created a Dutch subsidiary to manufacture some of its lines for export to the US. Dutch skilled wages were 56 cents an hour compared to \$2.56 in the US.

Canadian Manufacturers Association president Ian McRae declared it was time to formulate a "whip stiff" set of policies to help overcome impediments to the orderly progress of the economy.

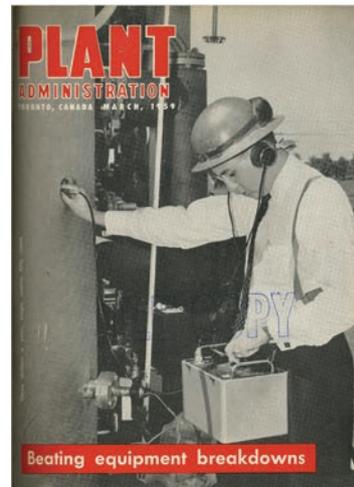
He identified spiralling wages and increased government spending as major factors.

PLANT Administration concluded a heavy responsibility lies with employee representatives. "Union negotiators should know where to draw the line, should be flexible in their demands, and should be realistic. Above all, they should have the courage to admit to their members the force of management's case on occasions."

Management and unions continue to grapple with these issues.

Comments?

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A 1959 *PLANT Administration* magazine cover.

leader by his ability to maintain the confidence and trust of those being led. When and to what extent office and clerical employees turn from you to trade unions for leadership may well depend on their evaluation of the leadership you now provide."

Labour comes up again in 1957 when *PLANT Administration* examined costs related to wages. *Cost cutters can offset price hikes* identifies a 2.5% edge wages had over price increases with more hikes coming as automatic increases. In 1956, weekly wages jumped from \$60.87 to \$64.19, a 5.5% increase. Prices increased



Measures to spur innovation and enhance cleantech development highlight the Liberal government's first budget.

BY MATT POWELL, ASSOCIATE EDITOR

While the Liberal government's 2016 federal budget spends big, it intends to help Canadian companies leverage their technical advantage through research and innovation.

The higher than expected \$29.4 billion deficit projected by Finance Minister Bill Morneau is of particular concern considering the figure is nearly three times original estimates. And small- and medium-sized businesses might not be happy that the small business tax rate remains at 10.5%, halting a scheduled reduction to 9% unveiled in last year's budget. The Canadian Federation of Independent Business (CFIB) estimates the move will cost small businesses more than \$900 million annually by 2019.

But manufacturers will find there's a lot to like, particularly measures and piles of cash to drive innovation, while speeding up development of the promising cleantech sector. An infrastructure spending plan that commits \$11.9 billion over five years will also provide spin-off benefits to manufacturers and is meant to spur job creation.

Jim Menzies, Canadian manufacturing leader at Grant Thornton LLP, is particularly pleased with the government's Innovation Agenda, which commits \$3 billion for clean technology investments and measures to improve collaboration on research and innovation between industry and academia.

"Governments can really help manufacturers by supporting the innovation process, and it seems like the new federal government is focused on ensuring manufacturers have the support they need," he says. "I think that's a very good thing."

Canadian Manufacturers & Exporters (CME) was also pleased with the government's commitments to realign Canada's

BIG SPENDERS

HIGHER DEFICITS, BUT LOTS TO LIKE

innovation support network and strengthen ties between post-secondary institutions and industry.

"We can't afford to take our eyes off the importance of investment in new products, new technologies and new skills for manufacturing success and job growth," says Matthew Wilson, CME's senior vice-president. "The budget takes several important steps to help companies make these critical investments."

R&D support

The Innovation Agenda commits more than \$1 billion over four years for clean technology investments in the forestry, fishery, mining, energy and agriculture sectors, and \$130 million over five years to support clean technology research and development.

Another \$2 billion to be spent over three years is for a new Post Secondary Institutions Strategic Investment Fund to bring together schools and affiliated research and commercialization organizations. The program will cover up to 50% of eligible infrastructure project expenses.

And \$800 million over four years, starting in 2017-18, will support innovation networks and clusters.

Although the program is geared to all sectors of the economy, Menzies says manufacturing will be a beneficiary.

"Enhancing on-campus commercialization is a serious injection into the whole innovation infrastructure."

Comments? E-mail mpowell@plant.ca.

The good news

How manufacturers will benefit

Here are some budget measures that provide opportunities for manufacturers:

- More than \$120 billion to be invested in infrastructure over 10 years to improve public transit systems; investments in water, wastewater and green infrastructure projects; and social infrastructure.
- There's not much for the auto sector in direct benefits, but the budget extends the Automotive Innovation Fund (scheduled to wrap up in 2018) through 2020-21.
- The Canadian Space Agency gets \$379 million over eight years to formalize negotiations with NASA and undertake the necessary activities to extend Canada's participation to 2024.
- Tariffs on about a dozen manufacturing inputs have been eliminated to provide savings of up to \$9 million over the next five years for producers in the

consumer goods and transportation sectors.

- There's \$50 million over two years for Natural Resources Canada to invest in technologies that reduce greenhouse gas emissions from the oil and gas sector.
- A broader range of stationary electrical energy storage equipment eligible under CCA classes 43.1 and 43.2 has been allowed. Stand alone electrical energy storage property will be included in class 43.1 when the round trip efficiency of the energy storage is greater than 50%.
- Six regional development agencies will double their support for clean technology to \$100 million per year from existing resources starting in 2016-17. They are: Atlantic Canada Opportunities Agency; Canada Economic Development for Quebec Regions; Canadian Northern Economic Development Agency; Federal Economic Development Agency for Southern Ontario; Federal Economic Development Initiative for Northern Ontario; and Western Economic Diversification Canada.



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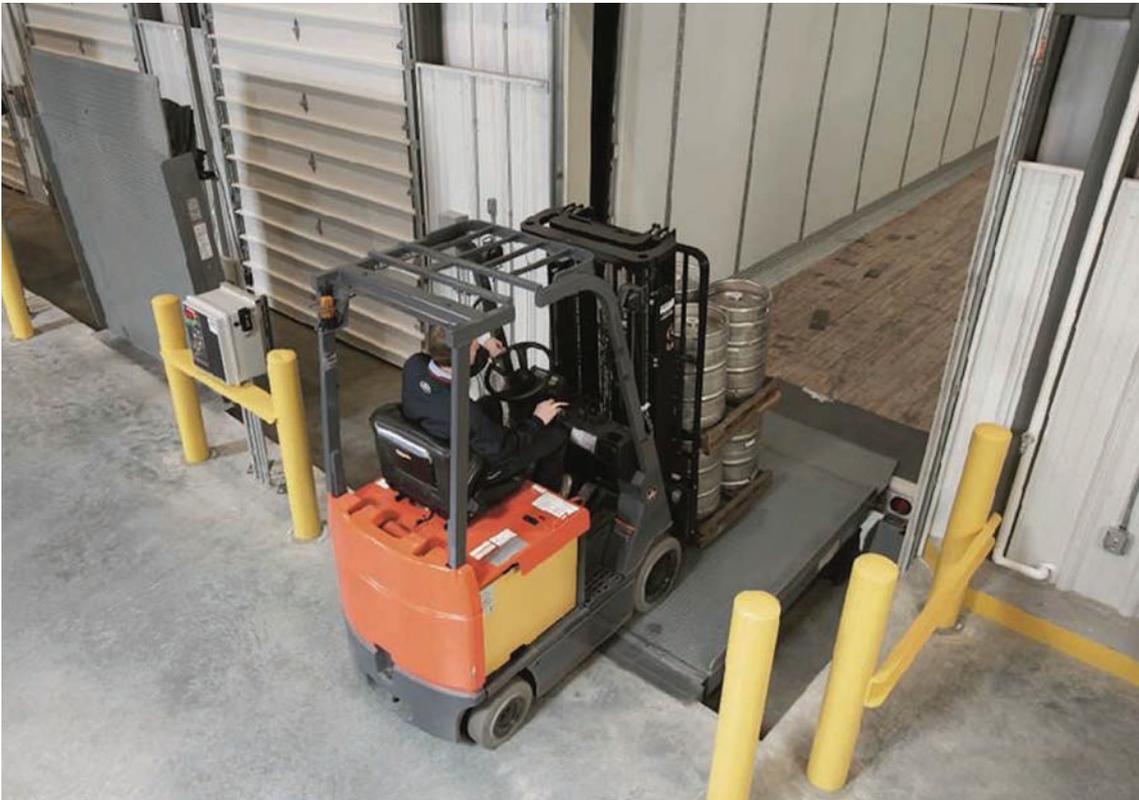


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The same equipment that allows traffic flow on the loading dock prevents goods from illegally leaving the dock.

PHOTO: RITE HITE

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TIPS FOR CURTAILING THEFT AND TAMPERING

Properly outfitted docks enhance safety while reducing the risk of damaged or stolen products.

Cargo theft has not been the subject of any blockbuster movies or best-selling novels, but it should be top-of-mind with plant managers. What was once thought to be an opportunistic crime has now become highly organized, with operations

in place that match buyers with targeted shipments.

A Canadian Trucking Alliance (CTA) and insurance industry report estimates \$5 billion in cargo is stolen each year in Canada. The Insurance Bureau of Canada, the CTA and law enforcement (among others) have done their best to combat this problem by forming and expanding a cargo theft-reporting program to the western provinces of Canada late last year. While these efforts have helped, the problem continues.

Some thefts occur at truck

stops or other unsecure points on the road, but many more actually take place in seemingly secure areas, such as warehouse yards and loading docks. Thefts (or tampering) at loading docks and drive approaches are becoming more prevalent. Companies put themselves at risk when the security seal on a trailer is broken, or put in place by non-company personnel on the approach. Without proper security or surveillance on the drive approach, goods are more easily stolen.

Continued on page 32

SUPPLY LINES



The Norcan Fluid Power team.

PHOTO: NORCAN

BOSCH DISTRIBUTOR

Norcan Fluid Power Ltd., a distributor of industrial, mobile and marine hydraulic components and services based in Vancouver, is now the authorized distributor for Bosch Rexroth Canada Corp. in Western Canada.

Bosch Rexroth, which manufactures industrial products and systems including hydraulics, has support locations in all major business centres across Canada, plus a head office, manufacturing and logistics centre in Welland, Ont.

It will maintain a direct market strategy while supporting future growth through the new Norcan agreement.

SOLUTIONS PARTNER

JMP Engineering Inc. (JMP) has enhanced its partnership with Rockwell Automation, moving up from Recognized System Integrator (RcSI) to a Solution Partner. It's one of 50 companies in North America to achieve this status.

The engineering services company based in London, Ont. is also certified by the Control System Integrators Association and Robotic Industries Association.

JMP provides turnkey solutions for controls, information and smart robotic applications for Fortune 500 manufacturers and producers. Having Solution Partner status provides insight into Rockwell Automation's plans in areas such as hardware migration, technology roadmaps, product knowledge and IIOT solutions.

JMP has 11 locations in the US and Canada.

CARGO THEFT

Continued from page 31

Even with surveillance in place, goods that are stolen (especially food and pharmaceuticals) are a loss. While insurance will cover losses, the damage to a facility's reputation is not as easily compensated. Three areas of the loading dock can be upgraded to better defend against cargo theft:

1. Find the right automatic vehicle restraint. Using automated restraints instead of wheel chocks automatically secures trailers to the dock, ensuring it can't be mistakenly pulled away when a forklift is still loading or unloading. The restraint engages with a trailer's rear-impact guard or rear wheel.

Some automatic restraints will re-fire into a locked position if the trailer begins pulling away from the building or if there is external tampering. This feature helps protect workers from potential accidents, while keeping would-be thieves out of a trailer.

The most advanced automatic vehicle restraints offer a vertical engagement range of 22 to 76 cm. Some models help secure intermodal overseas container chassis, which are expected to become more prevalent across eastern Canada when the Panama Canal expansion is completed this summer. Vehicle restraints that aren't prepared to handle intermodal containers may greatly reduce security benefits.

For a more advanced layer of security, some automatic restraints integrate into building management or security systems.

2. Consider vertical-storing dock levellers. After the trailer is secured at the loading dock, the gap between it and the trailer bed must be bridged. Vertical-storing dock levellers allow the loading dock door to close directly on the pit floor instead of the leveller itself. This reduces energy loss by minimizing outside air infiltration and helps reduce dust, debris, rodents and other contaminants from entering the building. Security is improved by minimizing points of entry, plus the vertical design



Sealing the dock up trailer sides, across the top and in the corners. Inset: Locking down the dock. PHOTO: RITE-HITE

makes it easy to clean or wash down the pit floor when the leveller is in the upright and stored position.

Consider a variety of specific features before committing to an installation. First, look for a "drive-through" application that allows trailer doors to be opened inside the facility. Doing so allows staff to place or remove the trailer's seal from inside the building, greatly reducing the chance of theft or tampering.

For worker comfort and efficiency, look for a vertical leveller that provides the smoothest path between the facility floor and the

trailer. Reducing "dock shock" or whole-body vibration is good for forklift operators and minimizes damage to product and equipment. The most advanced levellers incorporate specialized rear and front hinges that minimize the bumps and gaps at the rear and front of the leveller, as well as a finely-tuned lip chamfer at the front of the leveller to reduce the speed bump effect normally felt by forklift drivers as they enter and exit the trailer.

3. Effectively seal the dock perimeter. Dock seals and shelters aren't normally considered when discussing anti-theft mea-

sures at loading docks. They're specifically designed to create an environmental barrier between the back end of the semi-trailer and the inside of the loading dock, and they also seal gaps that could otherwise be passageways for thieves to move product.

For maximum protection, equip all dock door openings with a system that closes the gaps created when a trailer is backed in for loading or unloading. This includes securing the tops, sides and bottoms of the openings when the trailer is in place. Foam compression dock seals, or full-access dock shelters that seal trailer door hinge gaps combined with a full-coverage, under-leveller sealing system, are recommended in most applications.

Securing the dock

Some of the newest dock shelters have been specifically designed for drive-through applications, which complement vertical storing dock levellers. This allows the trailer doors to open inside the building for security purposes, while maintaining a tight, consistent seal. Special design features ensure tight sealing against sides, across the top and at the corners without interfering with doors being opened and closed after the trailer has been parked.

Securing a loading dock isn't usually as simple as installing one product. In most instances, a systematic approach must be taken. Finding the right combination of automatic vehicle restraints, vertical dock levellers, appropriate seals/shelters and the proper sequence of operation enhances cargo security, protects employees, reduces contamination and improves environmental conditions.

This is an edited version of an article provided by Rite-Hite, a manufacturer of industrial fans, dock equipment, industrial doors and safety barriers based in Milwaukee, Wis. Visit www.ritehite.com.

Comments?
E-mail jterrett@plant.ca.

PRODUCT FOCUS

SAFETY

CONTROLLER SIMPLIFIES MACHINE SAFETY

Manufacturers and equipment builders can simplify and standardize safety across their machines and systems with the Allen-Bradley Compact GuardLogix 5370 controller from Rockwell Automation. It doesn't require separate networks and controllers for safety and motion in applications with up to 16 axes.

It's integrated on a single EtherNet/IP network and achieves Safety Integrity Level 3, Performance Level e and Category 4 – the highest ratings for machine safety. When used in combination with the Allen-Bradley Kinetix 5500 servo drive or the Allen-Bradley PowerFlex 527 AC drive, users have integrated safe torque off one EtherNet/IP.

The 5370 is configured with Rockwell Software Studio 5000 software. Data is defined once,



Integrates safety and motion.

then easily accessed and re-used across different machine types to speed system development and commissioning.

The single programming environment for both safety and standard control eliminates manual management of separate standard and safety memory, or partition logic to isolate safety.

Dual ethernet ports support both linear and device-level-ring (DLR) network topologies. Built-in energy storage eliminates batteries, and a removable 1-GB Secure Digital (SD) card improves data integrity.

Rockwell Automation, a developer of automation technology, is headquartered in Milwaukee, Wis. with a Canadian corporate office in Cambridge, Ont.

www.rockwellautomation.com



No blanking, muting.

LIGHT UP YOUR MACHINE GUARDING

Omron Automation and Safety's F3SG-RE global safety light curtain provides machine guarding that doesn't require blanking or muting.

Simple on/off detection covers straightforward applications and complements the fully programmable, multi-segment cascading F3SG-RA safety light curtains.

Both series have finger and hand protection models with 14- and 30-mm resolution.

IP67-rated housing withstands water washdown without additional protective tubes.

The F3SG-RE is supported by 24-hour multi-language online diagnostics that allow operators around the world to check error details in their local language.

Online support and troubleshooting is accessible by scanning a QR code sticker applied to the machine using a smartphone or tablet.

Features include: Smartclick connectors and optical synchronization that simplify set up and wiring; quick troubleshooting and preventative maintenance via accumulated log data; and DIP switches that change light emission intensity to prevent interference with other sensors.

Omron, a manufacturer of industrial products, has Canadian offices in Toronto. www.omron247.com



Four models on a roll.

SAFELY MOVE LARGE ROLLING LOADS

The RollMover from Appleton Mfg. makes moving loads from 100 to 100,000 lb., such as large master rolls of paper, plastic, film, foil, fabric, tissue, towel, nonwovens, or fiberglass mat, as well as large trucks or chassis, easier and safer.

The steel frame is lightweight and compact, easy to use and simple to store. And there's no need for air hoses, which have length limitations and can be a trip hazard on the work floor.

There are four models: Standard Duty safely moves loads up to 6,500 lb.; Heavy Duty handles 50,000 lb.-plus; Extra Heavy Duty reaches 100,000 lb. plus; and the HD large roller has a large, contoured drive wheel for damage-free moving of soft material

rolls, including tissue and nonwovens.

Appleton Mfg. based in Neenah, Wis. makes industrial products.

www.appletonmfg.com

FOG-RESISTANT EYEWEAR

Honeywell's Uvex Livewire sealed safety eyewear with the HydroShield anti-fog lens coating protects against fogging.

The coating is permanently bonded to the lens and will not come off after extended wear or repeated cleanings and it's highly scratch-resistant.

The solid black frame is available in Clear or Espresso lens tints and is worn with easy-to-exchange temples or a headband to ensure a secure, sealed fit.

The eyewear is 100% dielectric for safe wear in electrified environments delivers 99.99% UV



Secure, sealed fit.

protection and meets both ANSI Z87.1-2010 and CSA Z94.3 safety standards.

Honeywell Safety Products is a manufacturer of personal protective equipment based in Dallas.

www.uvex.us

PRODUCT FOCUS

RELAYS ARE POSITIVELY DRIVEN

AutomationDirect has expanded its line of safety products to include additional Dold safety relay modules that are positively driven for reliable opening and closing.

The relays are controlled by a built-in monitoring function for applications with e-stops, safety gates and light curtains.

The 24 VDC safety mat switch with manual or automatic start can also be used for safety edges and feature two normally open contacts, line fault detection at the ON pushbutton, and LED indicators.

The LG5928 features one or two-channel connection, two normally open instantaneous positive-guided safety contacts, one normally open time-delay, positive-guided safety contact, LED indicators and a short response.

The LG7927 and LG7928 extension modules provide additional contacts for emergency-stop modules and safety gate monitors.

The UG6929 safety relay extension module provides safety contact multiplication with up to five



Built-in monitoring.

normally open contacts and one normally closed contact for feedback signals. The UG6961 module is a dual-channel emergency stop with adjustable delay featuring line fault detection, manual or automatic restart, cross fault monitoring and two normally open selectable positive-guided safety contacts and one normally open time delay monitoring contact.

The UG6960 dual-channel module features forcibly guided output contacts, pluggable terminal blocks and four normally open outputs. Release delay, on delay and release delay retriggerable are settable via potentiometer.

The UG6970 handles applications with various safety devices providing two independent, separately adjustable safety functions.

AutomationDirect is a distributor of industrial automation products based in Cumming, Ga.

www.automationdirect.com

SUPPORT FOR STRENUOUS LIFTING

Allegro Industries' Liftbak back supports provide 5 in. of belt made with rigid foam for strenuous lifting.

The buckle and locking closure holds securely while allowing for easy adjustment.

The Deluxe Spanbak version has breathable spandex backed with rubber grip webbing to prevent ride-up. The Spanbak comes in five sizes and the 9-in. Flexbak's patented three-part closure ensures a custom fit and superior lumbar support for maximum bracing without pinching or riding up.

The Economy Hi-Vis offers has the same features, plus high-visibility green suspenders and side elastic panels.

Allegro is a manufacturer of safety products based in piedmont, SC. www.allegrosafety.com



Easy adjustments.

CNC CONTROL SIMPLIFIED

Implementing functional safety on new CNC machinery is a trend in the metalworking machinery marketplace so NUM has introduced NUMSafe as a build-to-order option for the company's latest-generation Flexium+ CNC platform.

It scales to suit the complexity of the machine control system and includes a safety PLC, safety input and output (I/O) modules, digital servo drives with built-in safe motion monitoring facilities and compatible brushless servo motors.

Designers of basic 3-axis machines through to complex automation with 100-plus axes can include functional safety features precisely where they are needed, with minimal additional components or wiring.

A CNC's PLC may lead to unnecessarily



Scales to suit complexity.

complex control schemes with redundant logic, causing significant additional set-up and programming overheads.

A dedicated safety PLC and clearly differentiating between standard and safety-related logic overcomes these concerns. Machine designers implement safety functions that are pertinent to the current task, without

worrying about extraneous functions for motion axes that are not involved in orderly shutdown routines.

Integration is further simplified by Safety PLC and safety I/O modules housed in the same standard terminal as other elements of the control system.

All communication between the machine's control system and servo drives is handled via EtherCAT field bus, using a Fail Safe over EtherCAT (FSoE) protocol to ensure the integrity of safety-related data.

The application program for the safety PLC is created using the same suite of software development tools used to commission the overall system, including CNC, PLC, drives and I/O modules.

NUM is a manufacturer of CNC machine controls based in Naperville, Ill.

www.num.com



Controls spring energy

REEL SAFELY SLOWS COILING

Coxreels' EZ-Coil safety system engineered for the spring retractable line of reels retracts up to 80% slower than conventional reels.

When in recoil, the safety system controls the aggressive spring motor energy. It works uni-directionally without any increase to the amount of resistance when pulling out the hose, cord or cable.

Coxreels is a manufacturer of hose, cord and cable reels based in Tempe, Ariz.

www.coxreels.com

SAFETY



Blocks personnel from falls.

GATEWAY PROTECTS MEZZANINE LOADING

The Protect-O-Gate Pivot Gate from Benko Products Inc. eliminates the potential for falls and other accidents associated with mezzanine loading areas.

Counter-balanced and operator-friendly, the unit provides easy access to staging areas.

The pivot gate can't be bypassed. When the enclosure closest to the edge of the mezzanine is lifted to allow load delivery, the second enclosure is resting on the mezzanine, blocking personnel from potential falls.

Custom sizing is easily accommodated with optional increased load height to 80 in.

The unit ships assembled.

Benko Products is a manufacturer of industrial products based in Sheffield Village, Ohio.

www.benkoproducts.com

TEST AND MEASUREMENT



Inputs are protected up to ±60 VDC.

CALIBRATOR DETECTS RTD CONNECTIONS AUTOMATICALLY

Saelig Co. Inc.'s PIEcal Model 525B automated RTD and thermocouple calibrator with its stable, low drift circuit design and a +/- 0.05 degree C reference thermistor tests applications

that require high accuracy and resolution.

It shows the precise resistance value when displaying RTD temperature. RTD connections of 2, 3 or 4 wires are detected automatically, as are individual open circuit wire connections.

Inputs are protected up to ±60 VDC against possible misconnection.

The unit's double-click menu system allows quick setup, fast

switching between functions and simple pre-programming of set points or step/ramp times.

Standard functions include sourcing and reading of 14 thermocouple types, 12 RTD curves, millivolts and resistance. A turn cold junction compensation on/off capability displays temperature while a secondary screen shows mV/Ohm temperature values.

Troubleshooting functions include the ability to read and

display an RTD transmitter's excitation current to confirm the transmitter is operating correctly.

The unit is compatible with all process instruments and connects directly to the temperature inputs of transmitters, PLCs and multichannel recorders to verify their outputs or displays.

Saelig is a distributor of test and measurement equipment based in Fairport, NY.

www.saelig.com

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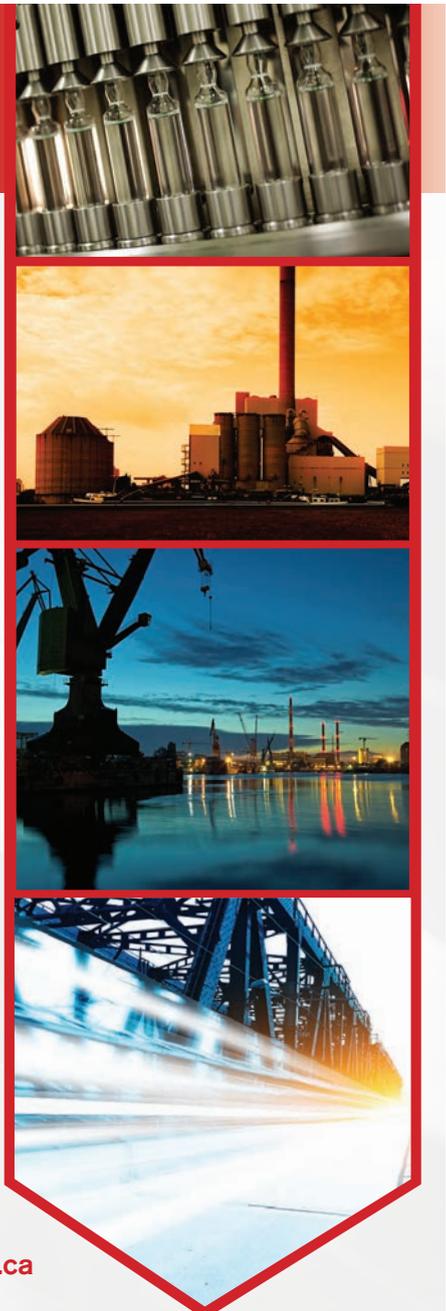
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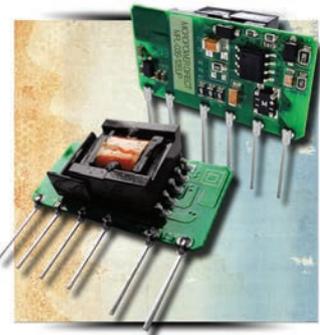
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PRODUCTS AND EQUIPMENT

POWER SUPPLY



EN 60950-approved.

USE THESE POWER SUPPLIES IN REMOTE LOCATIONS

MicroPower Direct's MPL-03SE-UP 3 W AC/DC power supplies handle space critical, board-level applications, with six standard models operating from inputs of 85 to 264 VAC.

The miniature and safety approved units are used in high voltage DC/DC applications with an input of 70 to 400 VDC and regulated single outputs of 3.3, 5, 9, 12, 15, or 24 VDC. They're also equipped with tight line/load regulation, continuous short circuit protection, input/output isolation of 3,000 VAC and over power protection.

A Class II input allows the units to be used without an earth ground connection for remote or portable equipment. Pin-out is industry standard.

All six models are rated for a temperature range of -40 to 85 C

(ambient).

MicroPower Direct is a manufacturer of power supply and conversion products based in Stoughton, Mass.

www.micropowerdirect.com

CONVERTERS DELIVER 92% EFFICIENCY

Polytron Devices' LPA30 30-watt DC-DC converters handle a range of applications in wireless networks, tele and data communications, industry control systems, distributed power architectures and semiconductor equipment.



RoHS-, Reach-compliant.

With a 2:1 wide input voltage range, they deliver 92% efficiency. There's a six-sided continuous shield and no minimum load requirement.

The low profile (1 x 1 x 0.39 in.) converters are RoHS- and Reach-compliant, and meet all UL60950-1, EN60950-1 and IEC60950-1 safety standards.

Polytron is a manufacturer of power supplies based in Paterson, NJ.

www.polytrondevices.com

MOTION CONTROL



Continuous linear speed.

SCREW/SLIDE FOR ACCURATE POSITIONING

The WGS wide guide screw/slide system from Haydon Kerk Motion has a screw-driven carriage that delivers reliable, continuous linear speed, while maintaining accurate positioning.

Length and speed of the WGS are not limited by critical screw speed, allowing high rpm, linear speed and long stroke lengths.

Stroke options of 6, 12 and 18 in. come in 0.1-, 0.5- and 1.0-in. leads.

Other imperial and metric leads are available that include short leads for non-backdriving vertical applications that eliminate the need for brakes, and longer leads capable of speeds of more than 60 in./sec. (1.5 m/sec.).

Sliding plane bearings on a low-profile aluminum guide rail keep the motion smooth throughout the travel distance.

All moving surfaces include Kerkite high-performance polymers running on a Kerkote TFE coating.

The slides come with wear-compensating, anti-backlash driven carriages.

Haydon Kerk, a business unit of AMETEK Inc., is a manufacturer of motion solutions based in Waterbury, Conn.

www.haydonkerk.com

HIGH-TORQUE STEPSERVO MOTORS RUN COOL

StepSERVO Motors from Applied Motion Products fuse step motor, drive and control components into a single device to save space, reduce wiring and cut costs in packaging, test and measurement, and assembly applications.

They provide the same high-torque-at-low-speed and excellent holding torque characteristics of open loop stepping motors with the advantages of true closed-loop control.

Users create peak torques

up to 50% higher than normal range of the same step motor running open loop. A closed-loop servo control speeds up machine cycles to enhance productivity, only drawing current as it's needed to keep the motors running cool.

The motors come in NEMA frame size 17, 23 and 24 and use 5000 line incremental encoders (20,000 counts/rev).

IP65 versions handle wet and dusty environments. There's also an EtherNet/IP industrial networking option and a CANopen



NEMA frame size 17, 23 and 24.

fieldbus function.

Applied Motion Products is a manufacturer of motion control products based in Watsonville, Calif.

www.applied-motion.com

SENSORS

CART MOVES IRREGULAR-SIZED PARTS

Creform's saddle cart holds and delivers irregular and contoured shaped parts such as flexible rubber and sheet good parts, wire harnesses and weather stripping.

The upper level holds the top of the part, the lower level the bottom. Surfaces are wide so parts can be spread out to avoid tangling, but they also improve picking efficiency.



Two casters swivel.

NETWORKING

ADAPTER PROTECTS NETWORKS FROM THE ELEMENTS

EAO Corp.'s Series 84 USB 3.0 adapter protects against the elements in harsh environments where network designers need to connect to a computer, server or a network.

It's used wherever ROM upgrades, simple file or data transfers are necessary within the most up-to-date USB standard. USB 3.0 allows for efficient backwards support compatibility to older 2.0 applications and increases data transfer speeds, improved bandwidth and upgraded power management capabilities.

Sockets are IP65-rated and for added flexibility are available in cable lengths of 60 or 100 cm.

EAO is a Swiss manufacturer of switches, keyboards and HMI control units.

www.eao.com



Efficient backwards support.

The 50 x 60 x 36-in. carts hold up to 300 lb. and can be engineered to meet a variety of manufacturing applications and dimensions.

Each shelf has a 1/4-in. black corrugated surface bent to create a curve. This surface is supported with anti-static 28-mm pipe and joints, and angle bracing for additional strength. Four six-inch diameter casters support the cart for easy rolling.

Creform Corp. is a manufacturer of material handling equipment based in Greer, SC. www.creform.com

TRUCK STACKS, MANOEUVRES SMOOTHLY

The LNB-2 powered elevating two-wheel hand truck from Lift'n Buddy combines the vertical lifting capabilities of a small powered stacker with the manoeu-



Eliminates bending while loading.

vrability of a conventional unit.

It transfers loads to shelves, workbenches, conveyors, processing equipment, delivery trucks and customer vehicles.

At the touch of a button the powered, adjustable platform positions loads at a comfortable height to eliminate bending and stretching when loading, unloading or moving items from one level to another.

The truck, powered by two maintenance-free 12 V rechargeable batteries, is built on a lightweight aluminum frame with powder coat paint finish. It lifts 200-lb. loads up to 37 in. and it does so quietly, and at up to 4 in./sec.

Lift'n Buddy manufactures lifting devices in Fargo, ND. www.liftnbuddy.com

WELDING

PURGE PLUGS REDUCE DOWNTIME

Huntingdon Fusion Techniques' nylon welding Purge Plugs for tubes and pipes up to 6 in. in diameter cover a variety of industrial applications.

They're made from engineering quality nylon 6 in sizes from 12 to 150 mm with a standard seal made from natural rubber. Seals made of silicone, nitrile and viton rubbers are also available.



Sizes from 12 to 150 mm.

The plugs work as "overnight stoppers," providing a strong barrier in pipeline activities to

prevent foreign bodies from entering the line during downtime. Other applications include leak testing and sealing holes.

The plugs are supplied with a hollow shaft with an outside 1/2-in. BSP thread for standard hose connections or solid shaft versions up to 1.5 in. for pressure testing.

Huntingdon Fusion Techniques is a manufacturer of weld purging products based in Carms, UK. www.huntingdonfusion.com



Pushing Performance

Relax, tomorrow has already been tested. Say goodbye to hardwiring with HARTING connectors.



SWITCHES

SWITCH RATED FOR GAS/DUST

Larson Electronics' EPS-2XPB-SG-MS 10 A explosion proof momentary push button switch is rated to Class 1 Division 1 & 2 and Class 2 Division 1 & 2 for hazardous locations where the atmosphere may contain gases and dusts.

The start/stop push button switch for controlling machinery or industrial processes is factory sealed, eliminating additional seal fittings or compounds.

The switch is enclosed in a separate sealing chamber, which has smooth, double flanges that mates both to the cover and the mounting enclosure for flame tight joints.



UL 698-certified.

Stainless steel hex head screws attach the sealing chamber to the cover and mounting enclosure. The housing is made of a malleable iron body with a cast copper free aluminum alloy cover and is epoxy powder coated.

The UL 698 switch is listed and rated for explosion proof locations.

Larson Electronics is a manufacturer of industrial lighting and power distribution systems based in Kemp, Tex.

www.larsonelectronics.com

Reduce the number of wiring errors, save time and headache.

HARTING, first established in 1945, delivers unrivaled reliability, efficiency, innovation and performance in connectors.

With HARTING you have a partner who ensures you dependable connections that stand the test of time.

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PRODUCTS AND EQUIPMENT

PUMPS



Rated up to 350 degrees C.

ETA PUMPS HANDLE THE HEAT

KSB's ETA single stage pumps handle high temperature heat transfer applications such as hot water circulation or heat transfer systems that use synthetic thermal oil.

The pumps, rated for temperature up to 350 degrees C, have a long-coupled layout to reduce heat transfer between the pump and the motor, reinforced casings and extra heavy-duty bearings that stand up to thermal stresses in piping systems.

Venting removes gases from the system during operations.

Variants with double mechanical seals are available for critical fluids.

They come with carbon or silicon carbide plain bearings.

The impeller is fine-tuned to match the required duty point

(head and flow rate) of the system so the pump's normal running conditions are close to its optimum efficiency point.

KSB Pumps Inc., based in Mississauga, Ont., is a member of the KSB Group, a pump manufacturer based in Germany.

www.ksb.ca



Interchangeable pads and splines.

PUMPS HANDLE HEAVY-DUTY APPLICATIONS

Twin Disc heavy-duty power take-off, hydraulically-actuated HP1200 pumps handle heavy-duty conditions in applications such as driving pumps, grinders, crushers, dredgers, shredders and heavy-duty drills.

With a maximum power rating of 1,243 hp at 1,800 rpm, the pumps allow for both side-load "P"

and in-line "T" applications by simply changing the bearing carriers.

An advanced control system allows smooth engagement of the driven equipment.

Auxiliary drive pump towers with 400 hp maximum capacity are rotatable by 0, 45 and 90 degrees, either clockwise or counter-clockwise, for clearance in installation.

Pads and splines in SAEA to E are easily interchangeable to accommodate varying pump sizes.

A mechanical brake release allows the output shaft to easily be rotated if the driven equipment becomes jammed, and there's an optional high-capacity brake with control logic that slows the output when driving large masses in a shorter amount of time.

Twin Disc is a manufacturer of heavy-duty industrial equipment based in Racine, Wis.

www.twindisc.com

PUMPS MANAGE CONTROL PARAMETERS

Watson-Marlow Fluid Technology's 530 peristaltic-cased pump meets the demands of rugged and remote environments found in metering and transfer applications such as surface coating, printing and lime addition.

The pumps check control parameters quickly and avoids errors with visual status through a colour display. An intuitive menu structure makes operator interaction easy.

Integrated PROFIBUS networking capabilities permit two-way, real-time communication to improve diagnostics and enhance response times, optimizing process control and minimizing downtime.

The pumps come in four drive options and nine pump-head variants, in both manual and automated control versions, delivering flow rates from 0.000026 to 0.92 gpm.



PROFIBUS networking capabilities.

Watson Marlow is a pump manufacturer based in Cornwall, UK.

www.wmftg.com

COMPRESSED AIR



Neutralizes static.

GUN REMOVES STATIC USING LESS AIR

EXAIR's Ion Air Gun removes static electricity, contaminants and dust from moulded parts prior to labelling, assembly, packaging, painting or finishing applications.

It meets CE and UL standards, and is RoHS compliant.

A metal armoured high-voltage cable protects against abrasion and cuts, and there's a replaceable emitter point, integrated ground connection and electromagnetic shielding.

The shockless air gun neutralizes static electricity and cleans at distances up to 4.6 m, incorporating a high velocity air jet that uses a small amount of compressed air to entrain 80% of the total airflow output.

An electrically energized emitter at the discharge end fills the entire airstream with positive and negative ions to neutralize high static charges quickly. An optional regulator handles infinite air volume and velocity adjustments.

Exair is a manufacturer of compressed air products based in Cincinnati.

www.exair.com

AIR FILTERS BOOST ENERGY SAVINGS

Kaesar Compressors Inc. has expanded its air treatment product line with compressed air filters in flows from 20 to 500 scfm.

The rugged filters deliver reliable compressed air quality with low pressure drop to boost energy savings.

The line includes liquid separator, particulate, coalescing and

INSPECTION

APEX IMPROVES CONTAMINANT DETECTION

Thermo Scientific's APEX upgrade for its metal detector platforms meets new, more stringent quality standards with the ability to detect smaller diameter metal contaminants.

The improved sensitivity reduces rework and scrap caused by occasional false rejects. Maintenance and training is also simplified via a common user interface if the plant has both APEX and DSP3 platform metal detectors.

The APEX upgrade eliminates setup adjustments through Thermo Scientific's Intellitrack XR (IXR) software, which is equipped with a signal processing approach that addresses the challenges of detecting smaller diameter metals.

This occurs when a product has a conductive property, which affects the magnetic field generated by the metal detector, typically found in high salt and high moisture product environments.

A food-grade ABS control panel easily handles shock, vibration, water and various cleaning solutions, while a touch-panel keypad has no moving parts to improve reliability.

Thermo Fisher Scientific Inc. is a manufacturer of test, measurement and inspection equipment based in Minneapolis.

www.thermofisher.com



Common user interface.

Flows from 20 to 500 scfm.



oil vapour adsorbing filters for a range of air quality requirements. Particulate and coalescing filters have deep pleated filter elements wrapped in stainless steel cages to boost filtration and increase efficiency.

Vapour filters use high efficiency carbon matting to prevent channelling, reduce pressure drop and prevent particles from escaping.

Kaeser is a manufacturer of compressed air equipment based in Boisbriand, Que.

www.kaeser.ca

MACHINING



Cut processing times, costs.

FACE MILLS BOOST SURFACE FINISH

Walter's M2025/M2026 octagon finishing face mills seal surfaces on large cast iron components, ensuring they're completely flat.

High feeds and cutting speeds cut processing times and ease of handling reduces setup requirements.

They're equipped with efficient 16-edged octagonal peripheral inserts and three, four-edged, wiper inserts. Inserts are negative, while the cutting edge geometry is positive.

Convex edge wiper inserts ensure a high quality surface.

All inserts are precision ground. Cutter bodies and cutting edges are changed rapidly

thanks to wedge clamping of the octagonal inserts.

They're available in WAK15, WKP25S and WHH15 grades. Adjustments of the cutting edges are unnecessary.

Walter is a manufacturer of cutting and milling tools based in Waukesha, Wis.

www.walter-tools.com



High run-out accuracy.

TOOLHOLDERS ENSURE SMOOTH SURFACES

Schunk has expanded its line of hydraulic expansion toolholders with the Tendo Aviation for demanding aerospace applications.

It combines hydraulic expansion technology with the benefits of Weldon toolholders, which include high run-out accuracy, a balancing grade of G 2.5 at 25,000 min-1, complete vibration damping, and fast tool changes using an Allen key.

Run-out accuracy and vibration damping prevents the cutting edge from wear, extends tool life, and ensures smooth surfaces. The uniform load profile ensures a longer service life of spindle and spindle bearing.

An integrated anti pull-out mechanism ensures proper tool orientation and form-fit clamping when using the Weldon shank.

The toolholder is available for HSK-A63, HSKA 100, CAT 40 and CAT 50 interfaces.

Schunk is a manufacturer of machining and toolholding products based in Lauffen am Neckar, Germany, with Canadian operations in Mississauga, Ont.

www.schunk.com

INCREASED MACHINE USE FOR STEEL TURNING

Sandvik Coromant's CoroTurn 300 increases handling efficiency and prolongs tool life in steel turning applications thanks to stable insert clamping and eight-edge inserts that enhance chip control,



Accuracy within ± 0.05 mm.

tool life and surface finish.

Sandvik's iLock interface securely locks the insert in place to prevent cutting forces from affecting the tool position. The interface ensures accuracy within ± 0.05 mm giving the operator indexing repeatability.

The eight-edged inserts are available in grades GC4325 and GC4315 featuring Inveio coating, a uni-directional crystal orientation for high wear resistance and long tool life.

Coolant from above controls chip breaking and underneath controls the temperature.

Sandvik is a manufacturer of machining and metalworking tools based in Stockhom. It has Canadian sales operations in Mississauga, Ont.

www.sandvik.coromant.com

SIMULATOR GENERATES CNC RENDERINGS IN 3D

Fanuc America Corp.'s CNC Simulator brings CNC control to the

classroom, providing students with easy exposure without a mill or lathe.

Based on Fanuc's Series 0i Model F platform, the simulator is operated in either milling or turning configurations and programmable as a 3-axis mill or a 2-axis/1-spindle turning system.

A 10.4-in. LCD monitor and QWERTY keyboard provides the look, feel and layout of the control as students navigate and program a fully functioning CNC. It transfers programs to the machines using a built-in ethernet connection, or Flash ATA or USB interface.



10.4 in. LCD monitor.

The simulator comes with a Manual Guide i-programming interface that generates 3D simulations before converting them back to conventional NC programs.

Fanuc is a global manufacturer of automation products based in Rochester Hills, Mich.

www.fanuc.com

WORKHOLDING

CLAMPS ROTATE ON A SINGLE PLANE

DE-STA-CO's 9500 pneumatic swing clamps feature several mounting options for better placement in tight spaces and have additional bore sizes for crowded welding and assembly fixtures.



Optional flange kit.

The clamps rotate on a single plane for consistent operation in tough conditions. They mount on any face, including the front or side of a fixture or an inside corner with an optional flange kit. Tapped mounts are also available to thread screws directly into the clamp body.

Two new mounts open up positioning options and simplify installation.

Bore sizes include 22, 32, 40 and 50 mm to fit a variety of light-duty needs. Clamping forces vary from 35 to 200 lbf, depending on the bore size.

All 90 degrees of rotation occur at the top of the stroke, so the arm travels straight down when clamping. Pneumatic swing clamps "corkscrew" downward.

DE-STA-CO is a manufacturer of automation and workholding equipment based in Auburn Hills, Mich.

www.destaco.com

PRODUCTS AND EQUIPMENT

LIGHTING



FLOODLIGHTS HANDLE HARSH ENVIRONMENTS

Lind Equipment's LE360LEDC high-efficiency battery operated LED floodlight is easy to transport to wet locations, remote sites or otherwise hard to reach areas.

The high efficiency LEDs, which last up to 50,000 hours, are coupled with a high-performing battery technology that allows light output to be customized based on needs.

At full power, the lights provide 6,000 lumens for four hours;

eight hours at 50%; and 25 hours at 15% power mode.

The cast aluminum lights are equipped with polycarbonate lenses. There aren't any moving parts or bulbs, and a heavy-duty housing protects it in harsh environments.

Lind Equipment is a manufacturer of LED lighting products based in Markham, Ont. www.lindequipment.net

LIGHTING BLITZES HIGH SPEED IMAGING

The portable 80W Solarlux Blitz LED bright lighting system from EYE Lighting for high speed/resolution digital imaging systems is used for static test labs or in larger test cells during safety testing.

The lights feature the latest chip on board (COB), super high intensity, white-light LED engines with 5,000 K colour corrected temperature (CCT). Instant "on" and DC electronic drivers provide continuous operation while elim-



inating light flicker/strobe during high speed imaging.

The lights are sealed, use a proprietary thermal convective system for cooling and produce minimal heat transmission on test targets.

EYE Lighting is a manufacturer of industrial lighting products based in Mentor, Ohio. www.eyelighting.com

FASTENERS

SELF-CLINCHING PINS INSTALL PERMANENTLY

PennEngineering's Type MPP microPEM self-clinching pins make easy work of demanding micro positioning and alignment applications in compact electronic assemblies.

The pins clinch permanently into stainless or other metal sheets as thin as 0.5 mm. The chamfered end of the pin enables easy mating-hole alignment and the head of the installed pin will be flush in the host sheet for a smooth and clean appearance.

They're installed automatically to streamline production and eliminate small part handling issues.



The pins come in diameters as small as 1 mm and in lengths as short as 2 mm. They're manufactured from precipitation-hardened stainless steel and are corrosion resistant.

PennEngineering is a fastener manufacturer based in Danboro, Pa. www.pemnet.com



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PLANTWARE

RUNS LINUX ON RX1400 ROUTER

Siemens has raised the IQ of energy industry networks (and others operating in harsh environments) with its Ruggedcom VPE1400 virtual machine software for the compact, cellular RX1400 router.



It runs your Linux operating system and applications on the RX1400 at the network edge. Data is pre-processed before it's transmitted to a data centre. This reduces the volume of transmitted data while increasing the stability, efficiency and performance of the network.

Applications running in the VPE1400 environment are safely partitioned from the Ruggedcom ROX II operating system, while still having full access to the RX1400's network, LTE and serial interfaces.

Siemens Corp. is a German manufacturer of industrial technologies with a Canadian head office in Oakville, Ont.

www.siemens.com

ADAPTERS CONNECT DIRECTLY TO ETHERNET

Ophir Photonics' EA-1 Ethernet Adapter connects its smart laser sensors directly to the bus without a PC connection.

The adapter supports Telnet and HTTP protocols. Installation and choice of an IP address are simplified via a supplied PC application. The software allows setup and basic functionality, such as monitoring power and changing measurement scales.

Each sensor stores configuration and calibration information in its smart plug. When the sensor is plugged into the adapter, the correct power and energy are measured and displayed.

The photodiode sensors measure low laser powers, from picowatts to hundreds of milliwatts and as high as 3 W. The thermal sensors measure from fractions of a milliwatt up to tens of thousands of watts.

The adapter also provides measurement of single shot energy at pulse rates not exceeding one pulse every ~5 s.

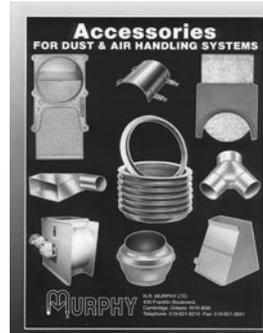
Ophir Photonics is a manufacturer of test and measurement equipment based in North Logan, Utah.

www.ophiropt.com/photonics



Industrial Literature Reviews

ACCESSORIES – AIR AND DUST HANDLING SYSTEMS



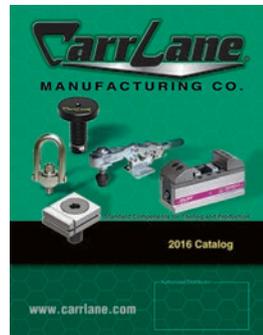
This fully illustrated, 8-page catalogue features a wide variety of accessories including: stamped and rolled angle rings, blast gates, galvanized spiral duct, diverters,

clean outs, nozzles, duct silencers, rotary air locks and exhaust fans.

www.nrmurphy.com

N.R. Murphy Ltd.

TOOLING AND FIXTURING



Carr Lane Mfg.'s 720 page catalogue provides clamps, pins, knobs, plungers, supports, locators and more. Featured items include nickel-plated hoist rings, modular Tiny

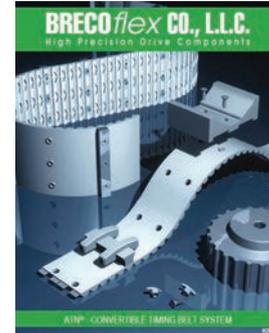
Visé edge clamps,

CL5 5-axis tooling, and the Carr Lock system for fast fixturing on horizontal and vertical machining centres.

www.carrlane.com

Carr Lane Mfg. Co.

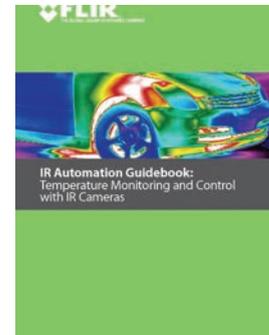
ATN CONVERTIBLE PROFILE TIMING BELT DESIGN



BRECOflex, CO., L.L.C. has developed a patented timing belt system that allows the customer to rapidly and easily attach profiles or product nests of any material directly to the belt. Profiles may be installed, replaced or exchanged while the belt is installed. Additionally ATN technology offers a field connection option using simple hand tools. www.brecoflex.com

BRECOflex

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<http://www.flir.ca/automation/content/?id=65833>

Flir

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EVENTS

RAPID SME

May 16-19, Orlando, Fla.

The conference and exhibition covers 3D printing, scanning and additive manufacturing. Visit www.rapid3devent.com.

Energy Summit 2016 EMC/NRCAN

May 17-18, Niagara Falls, Ont.

Canada's leading energy subject matter experts share their best practices in industrial energy efficiency. Visit www.emccanada.org.

Apprenticeship: Hands on the Future CFA

June 5-7, Vancouver

Biennial event highlights promising practices and innovative solutions in apprenticeship training. Visit www.caf-fca.org.

Global Petroleum Show DMG Events

June 7-9, Calgary

The conference featuring companies from 84 countries welcomes C-level executives, engineers, industry experts and more from all walks of the energy industry. Visit <https://globalpetroleumshow.com>.

EASA 2016 Convention and Exhibition EASA

June 12-14, Toronto

This Electrical Apparatus Service Association (EASA) event covers technical, sales and management in the environment and waste management industries. Visit www.easa.com/convention.

MainTrain 2016 PEMAC

Sept. 19-22, Mississauga, Ont.

PEMAC's 18th annual conference focuses on sustainable, effective and evolving strategies. Visit www.maintrain.ca.



Embrace your inner “Musk”

BY MATT POWELL, ASSOCIATE EDITOR

Not to get too fanboy-ish, but Elon Musk is a pretty remarkable guy. He’s hailed as a Silicon Valley celebrity; self-made billionaire, engineer, visionary; and a real-life Tony Stark (from the Iron Man comic-book series).

Some say he’s steering the history of technology. That might be a bit of a stretch, but he has an incredible ability to develop technologies that could potentially change industry and our lifestyles. Tesla made the electric car cool. SpaceX makes rocket ships reusable.

He’s known for labouring over minute details, such as the disappearing door handles on Tesla’s Model S (which drove his engineers insane), the odd temper tantrum and rage-fuelled firings. Yet those elements of his character drive his “willingness to tackle impossible things,” as described by Ashlee Vance in his biography *Elon Musk: Tesla, SpaceX and the Quest for a fantastic future*.

Vance also describes the “unified theory of Musk,” in which all of businesses are connected in the short and long term. Tesla produces battery packs for Solar City, the solar panel installer. Meanwhile, Solar City provides Tesla with solar panels for its vehicle charging stations. Tesla and SpaceX exchange knowledge about materials, manufacturing techniques and operating efficiencies.

Musk understands that an idea is just that, until it’s made into something.

Electric vehicles weren’t sexy or on track to be popular with consumers who didn’t see them as competitive with the power and stylish appearance of traditionally produced combustion engine vehicles. Tesla managed to deliver style and power. And no one, including NASA, had ever made a rocket that could return to Earth. SpaceX did it, albeit not before a few catastrophic failures, spectacular mid-air explosions and a few hundred million dollars going up in smoke.

Back on Earth, watch for Tesla’s Model 3, which should bring the electric car to the masses at \$35,000, compared to the \$100,000 price tag of the Model S (or \$130,000 for a Model X SUV).

He’s also aware of the benefits of collaboration and public-sector partnerships, even if he’s not always happy to admit it. It’s likely Tesla wouldn’t be around today had it not received a \$465 million loan from the US government in 2010 to commercialize the Model S.

And the Hyperloop, high-speed transportation system wouldn’t have come as far as it has without the collaboration of engineering students from around the world. A Space-X sponsored design competition, won by MIT, attracted more than 1,000 participants, tasked with designing a subscale transport pod. It’s an example of collaborative innovation at its finest, no matter how far off the technology is from implementation.

Yes, Musk has some superior (perhaps savant-esque) qualities and abilities, but great innovation isn’t just the domain of the brilliant.

Canadian manufacturing struggles with innovation. Lagging investment, weak collaborative efforts and general foot-dragging are all factors that account for Canada trailing its key competitors. The Conference Board of Canada concluded in a 2013 report that Canada was in desperate need of smart investment in skills and innovation to enhance its productivity and competitiveness.

Yet there are Canadian companies that get innovation. Examples include Clearpath Robotics, which develops autonomous robots for industrial applications; or Vanhawks, which aims to make urban cycling safer with its “connected” Valour bicycle; and Aeryon Labs, which is producing drones for multiple uses. Viryl Technologies, the focus of this issue’s cover story, is responding to a spike in vinyl record demand by developing a new, automated pressing machine that’s an alternative to increasingly rare vintage machinery.

Musk has a knack for innovations that have global impact, but innovation can also be great if it changes your company’s world by addressing a product development or production need with a solution that offers something different or better. It’s all about bringing ideas to life.

Comments? E-mail mpowell@plant.ca.

MUSK
UNDERSTANDS
THAT AN IDEA IS
JUST THAT, UNTIL
IT’S MADE INTO
SOMETHING...

Powder & Bulk Solids Events Calendar

Advanced Manufacturing

Expo | Mexico

November 15–17, 2016

Centro Banamex
Mexico City, Mexico
ManufacturingMx.com

MONTRÉAL SHOWCASE

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

November 30–December 1, 2016

Palais des congrès de Montréal
Montréal, Québec
PBSmontreal.com

TORONTO

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

May 16–18, 2017

Toronto Congress Centre
Toronto, Ontario
PBStoronto.com

TEXAS

POWER & BULK SOLIDS

CONFERENCE & EXHIBITION

October 10–11, 2017

NRG Center
Houston, TX
PBStexas.com

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"I am thoroughly impressed with the performance of the hardware and software. Some of the instructions are incredible time savers. I really like being able to make most any instruction into a oneshot. The message instruction allows mixing data types and reading to or writing from any list of tags to a group of Modbus addresses in a single message. What would have taken 32 messages in another product, I am doing with four in the P2-550..." Paul in NORMAN, OK

"...We like the idea that all the drive parameters are stored on the CPU, and can be downloaded to a drive when needed which is great for the maintenance staff (no more having to scroll through menus to configure the drive!)"
Todd in ONTARIO, CA

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