SPEC MY TRUCK

Check out Gabe Gallegos's rig, page 14.

INSIDE

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ServiceTruck

THE MAGAZINE FOR MOBILE REPAIR AND MAINTENANCE

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BUSINESS

Service trucks are assets, too

Mine manager examines mobile asset replacement for his MBA thesis

Nick Frenks stands between a Caterpillar 793 haul truck and a service truck at Teck Resources Limited's Highland Valley copper mine. Photo by Tyler Fredrickson.

SAUL CHERNOS

It's no surprise that heavy machinery and vehicles used in mining and other industries will eventually need major repair or replacement. But the same applies to mechanics' service trucks used to keep the equipment running. Service trucks are assets, too, after all!

Nick Frenks studied the landscape in 2015 when completing his master of business administration degree at Simon Fraser University in suburban Vancouver, B.C. Frenks had joined Teck Resources Limited as maintenance and materials manager at its Highland Valley copper mine near Logan Lake, B.C., a few years earlier and realized the mine's haul trucks were aging even as metal prices were slumping.

This presented a dilemma. Commodity boom-bust cycles are a fact of life in mining, and sagging

continued on page 19

PRODUCT KNOWLEDGE

Greasy Guidelines

Grease is more than just the stuff that goes home under your fingernails

DAN ANDERSON

When it comes to greases, appearances can be deceiving.

There are red greases, purple greases, and blue greases. But in reality, color has little to do with their quality or performance.

The natural color of most grease is wheat- or amber-colored, though moly greases — greases with molybdenum additives — tend to be black or shades of dark gray. Any coloration in a non-moly grease is artificial and ultimately a marketing ploy. There's no harm in a rainbow-colored grease, but generally no gain.

The consistency of grease can also be misleading. Uninformed users might assume a thick, tacky grease is a better lubricant than a runny, oozy grease. Harold Tucker, former tech director with Phillips Petroleum Company, once explained that the proper consistency of a grease depends on the way it is used.

continued on page 7

Mark England of Van Wall Equipment in Perry, Iowa, greases a John Deere 24-row planter. Photo by Dan Anderson

SAFETY

Warning lights can enhance safety but also pose risks, research finds. Photo by anna parciak/ iStockphoto.com

Research reveals "visual chaos" in service truck warning lights

Study examines some glaring omissions in lighting standards

MARK YONTZ

Warning lights and beacons are standard equipment on all types of service trucks, but their proper use does not totally eliminate the dangers workers face from drivers of other vehicles.

In fact, studies have shown that U.S. workers in the construction, transportation, and utilities sectors are over-represented in work-related injuries and fatalities, many of which involve motor vehicle crashes.

Given this, the Rensselaer Polytechnic Institute in Troy, N.Y., has partnered with the National Institute for Occupational Safety and Health (NIOSH) in a four-year project to more closely investigate the properties of warning lights and how they relate to worker safety. The fruits of that effort include a recent paper, titled "Intel-

continued on page 8

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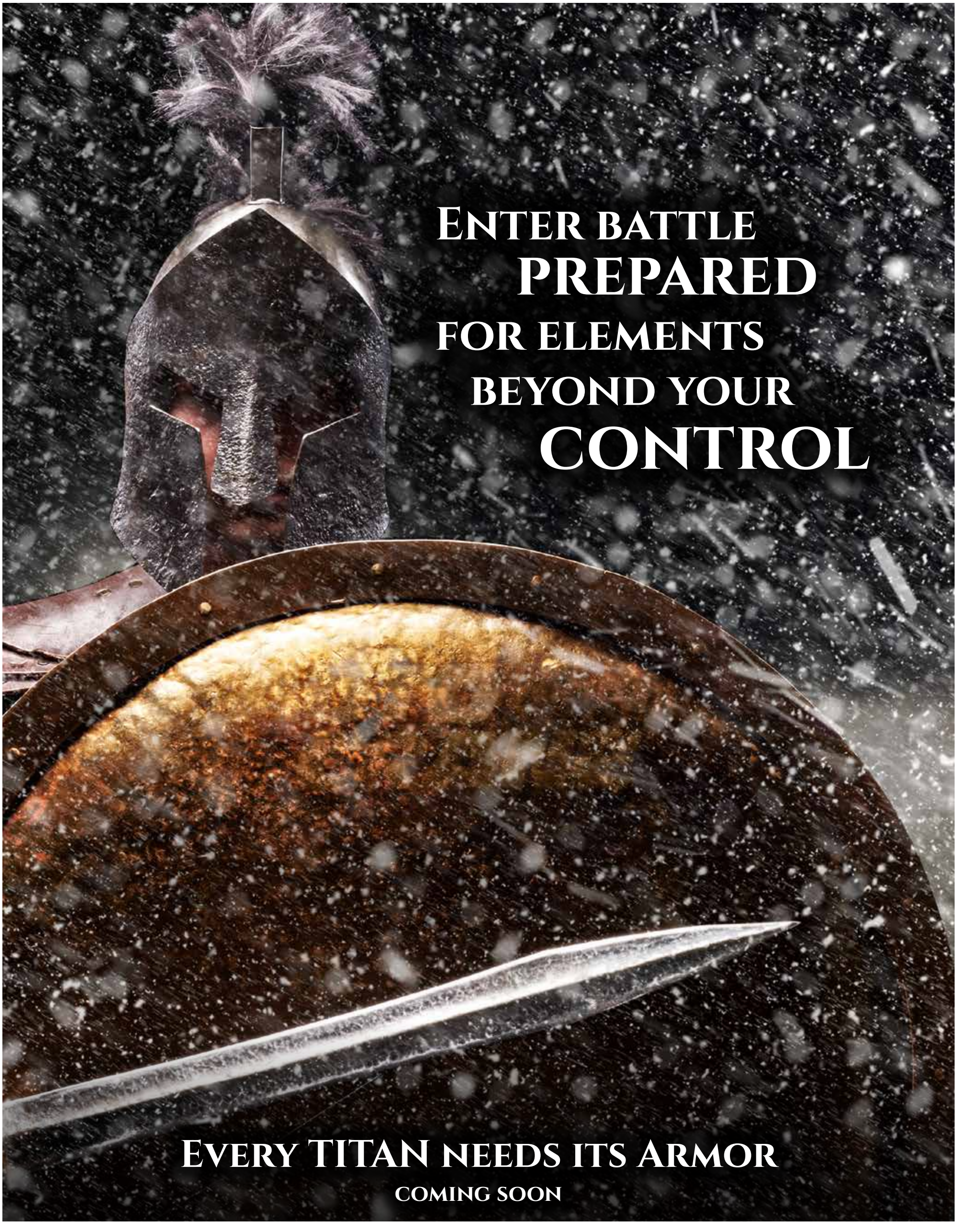
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Editor - Keith Norbury • editor@servicetruckmagazine.com

Advertising Sales - Nick Moss, Marketing Manager • **250-588-2195** or 250-478-1981 • ads@servicetruckmagazine.com

Art Direction/Production - James S. Lewis • james@capamara.com

Publisher - Tom Henry • publisher@servicetruckmagazine.com

Regular Contributors - Dan Anderson, Saul Chernos, Nelson Dewey, Erin Golden, Matt Jones, Mark Yontz

Subscriptions info@servicetruckmagazine.com
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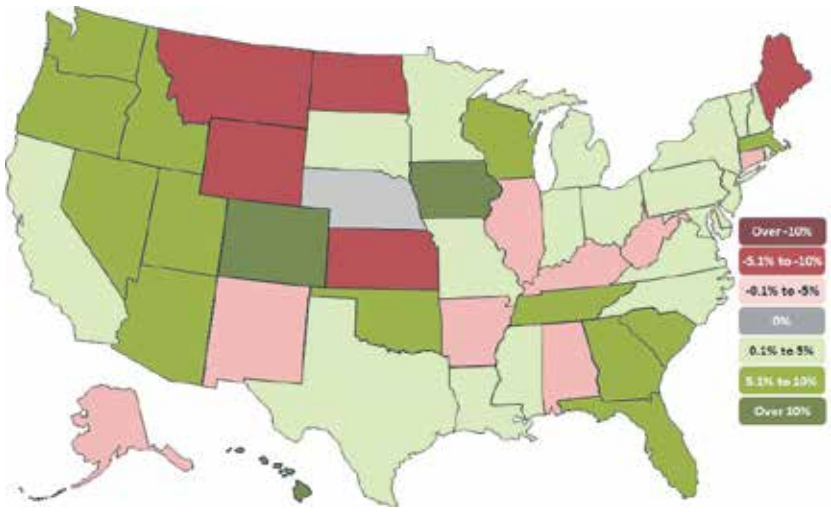
ADVERTISERS INDEX

Construction jobs hit eight-year high



Associated General Contractors of America map shows how construction employment changed state by state from August 2015 to August 2016.

Construction employment in the U.S. reached its highest level in September since 2008, according to an analysis by the Associated General Contractors of America.

Employers in the industry added 23,000 jobs in September compared with the previous month, the association reported.

"Demand for construction remains quite strong but contractors continue to struggle to find qualified workers," Ken Simonson, the association's chief economist, said in a news release. "The monthly declines the industry experienced during the summer were likely caused by worker shortages instead of shortages of work for many firms."

The September jobs totaled 6.669 million, which was 218,000 more than the previous September, a 3.4 percent increase, the association reported. The jobs hadn't numbered that high since December 2008, when there were 6.701 million jobs.

Average hourly pay for construction workers increased 2.8 percent compared with September 2015, the report said.

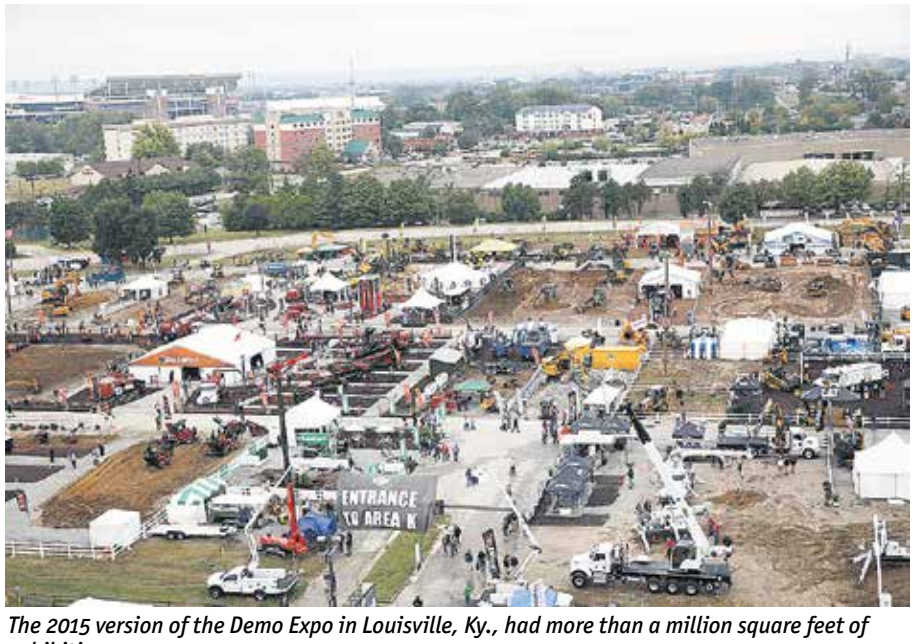
Kentucky show proves a winner

The International Construction and Utility Equipment Exposition has been honored as the largest biennial trade show of 2015 by *Trade Show Executive* magazine.

ICUEE, or the Demo Expo as it's also called, had 1,206,046 square feet of exhibition space, the magazine noted in announcing the 2015 Gold 100 Awards winners on its website.

The show — produced by the Association of Equipment Manufacturers and held every second year in Louisville, Ky. — was the second largest in the U.S. in 2015 behind only the Consumer Electronics Show in Las Vegas.

Earlier this year, the magazine named ICUEE as one of the fastest growing shows in the country. The Demo Expo also received a Grand Award from TSE magazine for fastest growing non-annual show in the number of exhibitors, said a news release from the AEM.



The 2015 version of the Demo Expo in Louisville, Ky., had more than a million square feet of exhibition space.

"Our strategic focus for ICUEE and all AEM shows is to offer a top-quality experience that engages attendees and exhibitors and helps them achieve measurable results from their show participation," the released quote Sara Truesdale Mooney, AEM's vice-president of exhibitions and business development.

The next ICUEE takes place Oct.3-5, 2017 at the Kentucky Exposition Center in Louisville.
For more information, visit www.icuee.com.

Show to have new keynote speaker

A scheduling conflict means that Daniel "Rudy" Ruettiger — who inspired the acclaimed 1993 football movie, Rudy — won't be the keynote speaker at the 2017 Work Truck Show next March in Indianapolis.

The National Truck Equipment Association, which organizes the annual show, said in a news release in late September that it would announce a new keynote speaker once a new one is confirmed.

The NTEA, which markets itself as the Association for the Work Truck Industry, had announced earlier in September that Ruettiger would address the show's President's Breakfast on March 16.

The show takes place March 14-17 at the Indiana Convention Center.

Rudy Ruettiger

MECHANIC'S MUSINGS

Tools from other trades

DAN ANDERSON

Some of the handiest tools I have didn't come off the Snap-on, Mac, Cornwell or Matco truck. The following are a few examples:

• A spool of carpenter's string never lies when I have to check a shaft or frame member for "straight." It may be difficult to fit a metal straight-edge between components inside a machine, but you can usually thread a stringline through tight places and pull it tight enough to decide if something is significantly bent or misaligned.

• Electricians use their "electrician's snake" to pull wires through conduits and channels. Those thin ribbons of spring steel work equally well to pull hydraulic hoses and electrical harnesses through frame tubes, booms and other components.

You never know when compressed air or a smartphone will come in handy.

• Office supply stores sell "air in a can," small cans of compressed air that office personnel use to blow dust out of keyboards and other delicate electronic devices. I keep a couple cans in my service truck for times when I don't want to drag an air hose and blow-nozzle deep inside a machine just to blow out a little dust and debris in a electronic control box, or behind a display console. Those spray cans are also good for blowing out spray nozzles on liquid application nozzles—much better than blowing with your lips on the nozzle (and you know you've done that).

• The cameras on modern smartphones have amazing resolution. If you're having trouble reading the fine print on a component, or the part number tag is twisted to the backside so you can't read it, take a picture with your smartphone and then "blow it up" on the phone's screen. It's better than a magnifying glass, and that way you have the number stored in your phone when you call the parts department to order it.

Dan Anderson is a part-time freelance writer and full-time heavy equipment mechanic based in Bouton, Iowa.

NEWS

Plug-in batteries added to service trucks

Service trucks with overhead lifts powered by lithium-ion batteries are being put into service at Southern California Edison.

The utility company recently added two such trucks to its fleet, according to an article this August on insideedison.com.

The batteries are the same as those used in plug-in electric cars, the article noted. They power the lift on two "troubleman" trucks, which are used by troublemen to investigate power outages.

The battery-powered system enables a troubleman to shut off the truck's engine while the lift is in use, the article said.

"Without batteries, the lift's hydraulic system would be powered by the truck's transmission, requiring the vehicle to idle during operation," the article noted.

The utility plans to acquire 22 more of the units.

Truck product conference cancelled but virtual presentations scheduled

Participant checks out a Hino chassis at 2015 Truck Product Conference.

A power outage forced the cancellation of the annual Truck Product Conference of the National Truck Equipment Association in September.

The conference venue — the Edward Village Hotel in Dearborn, Mich. — wasn't able to resolve the issue or predict when it would be resolved, the association said in a news release on Sept. 13, the day the conference was to begin.

The NTEA pledged that all reservation fees would be reimbursed. Registrants were asked to contact the hotel regarding reservations and to get in touch with the association about any concerns regarding the cancellation.

At the time the news release was issued, the association had not rescheduled the event.

However, on the conference website, the NTEA announced that the conference would be presented as a "virtual series, with individual OEMs sharing their presentations in webinar and other media formats."

The scheduled presentations began Oct. 24, after this edition went to press, and were set to continue until at least Nov. 9. The sessions were geared toward those who had registered for the conference.

For updates, visit http://www.ntea.com/truckproductconference.

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NEWS

Equipment auctioneer announces major deals

Ritchie Bros., the world's largest auctioneer of heavy equipment, has become even larger.

The auctioneer announced in late August that it has reached a deal to acquire IronPlanet, an online equipment auctioneer and marketplace. At the same time, Ritchie Bros. announced a strategic alliance agreement with equipment manufacturing giant Caterpillar Inc.

The deal to acquire IronPlanet for US$758.5 million is "subject to customary closing adjustments," said an Aug. 29 news release.

Found in 1999, privately owned IronPlanet had sales of about US$787 million in gross merchandise value, the release said.

Ravi Saligram

Gregory J. Owens

"This transformative transaction is the logical next step for Ritchie Bros., building on our multi-channel platform, global reach and long-standing customer relationships," the release quoted Ritchie CEO Ravi Saligram. "Together with IronPlanet, we will create a combined company of trusted brands with the ability to provide customers around the world with a greater number of choices and platforms to sell, buy and list equipment when, where and how they want — whether onsite or online."

Gregory J. Owens, chairman and CEO of IronPlanet, said in the release that his company's joining forces with Ritchie Bros. "will allow the combined company to deliver a multi-channel marketplace that will provide a full range of equipment asset management and disposition solutions."

Under the deal with Caterpillar meanwhile, Ritchie Bros. will become the equipment manufacturer's "preferred global partner for live onsite and online auctions" and "will complement Caterpillar's existing dealer channels."

Rob Charter, group president responsible for Caterpillar's customer and dealer support, called the partnership "an exciting new chapter in our relationship to better serve our global customers."

U.S. equipment exports plunge 24%

Exports of construction equipment manufactured in the U.S. dropped 24 percent in the first six months of 2016 compared to the same period last year, according to the Association of Equipment Manufacturers.

Exports to Canada dropped by 23 percent, although it remained the biggest region for U.S. exports at $2.4 billion, according to a news release from the AEM.

Europe was the only region, at two percent for a total of $898 million, to experience a gain in the period, noted the report, which cited U.S. Department of Commerce data.

Exports to South America declined 49 percent, to $504 million, while exports to Africa were down 43 percent to $220 million.

Graphic summarizes the decrease in U.S. construction equipment exports during the first half of 2016.

"For the past 14 quarters, U.S. exports of construction equipment have declined year over year and at the midpoint in 2016, that trend remains unchanged," the release quoted Benjamin Duyck, AEM's director of market intelligence. "With the global economic malaise, the slowdown in emerging markets and the negative interest rates in several economies' bond markets, investment is flowing to the U.S. and U.S. stocks, driving up demand for the U.S. dollar, inadvertently affecting our competitiveness abroad."

Other regional changes in exports of U.S.-made equipment were as follows:

- Central America fell seven percent, to $696 million;
- Asia dropped 28 percent, to $664 million; and
- Australia/Oceania fell 30 percent to $294 million.

Among countries, Mexico was the second largest market for the U.S. exports, at $561 million, which was a decrease of seven percent. Australia was third, at $273 million, down 29 percent.

The biggest gains were in Belgium — up 39 percent to $204 million; Germany — up 32 percent to $148 million; and Japan — up percent to $109 million.

Exports to Chile, meanwhile, plummeted 60 percent to $108 million. And exports to the U.K. declined by seven percent to $100 million.

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EDITORIAL

Election revealed divisions but ignored major challenges

One of the glaring omissions from the recent, and seemingly interminable, U.S. presidential election campaigns was the lack of attention paid to the relentless pace of technological change. Another overlooked area was in confronting what ought to be done about a changing climate.

By the time this goes to press, U.S. electors will have chosen their next president. That you are reading this indicates that the country and world didn't descend into the sort of death spiral that the major campaigns warned might happen. In the final weeks of the race, it became pretty clear who would win — whether fair and square or because of a rigged system. Those who study such things closely put the odds at north of 90 percent, in the ballpark of what the vast majority of climate scientists say are the odds that climate change is real and is caused by human activities.

Yet, even in an alternative universe where the unexpected happened, we would expect a smooth transition of power once the bluster of the campaigns faded away. Even so, the battle exposed deep divisions among Americans that transcended the healthy debates that make democracy strong. The country needs some serious healing.

Not just the U.S. but the world — witness the Brexit vote in the U.K. to leave the European Union; the opposition in the Wallonia region of Belgium over a free trade deal between the EU and Canada; and even the reluctance of voters in Colombia to endorse a plan to end a 52-year-old civil war. Add to that, the Syrian refugee crisis, the fight against the so-called Islamic State, and sabre-rattling from Russia and China, and it can seem like the world is headed for chaos.

It easy to forget, though, that today's geopolitical and economic challenges pale in comparison to the miseries enacted by the Great Depression and the Second World War. We forget that within the lifetimes of people still living that the U.S. and Germany were deadly foes and are now strong allies.

In a world of seven million plus people, you can always find examples of atrocities. But by and large — although you wouldn't know it from the news — the world, especially the industrialized world, is safer and wealthier than ever. A major reason for that is international trade. One thing most economists agree on is that freer trade is good for economic prosperity. They also agree, though, that the rewards haven't been equitably distributed — that some people have lost as others have gained.

Determining who wins and loses from trade isn't an easy calculation. Many workers in those countries have gone from subsistence poverty to the edges of middle class comfort. In just over a generation, much of China has transformed into a modern industrial society. And here in North America, consumers have benefited from the low prices of goods imported from developing countries.

During the U.S. presidential election race, the candidates tended to focus on the losses rather than the gains. Yet the prescriptions offered, such as higher tariffs or other barriers, wouldn't solve that problem. They'd merely be tantamount to cutting off one's nose to spite one's face.

Yes, it's true that trade has shifted American jobs to places with lower labor costs. Yet, a preoccupation with trade's role in that has overshadowed how technological changes are and will continue to play an even greater role in the transformation of employment.

Not only are robotic vehicles going to eliminate jobs, so will advances in additive manufacturing techniques such as 3D printing. (That's assuming that computer hackers, such as those who hijacked Internet-connected security cameras and other devices in October, don't stop the machines. If that happens, there'll be bigger worries.) And the jobs that can now be automated aren't just in assembly-line labour. They include professions such as lawyers and accountants.

Until recently, technology has always spawned new jobs. But one has to wonder if it's soon to reach a point where the new jobs will require such a high level of expertise that they're beyond the capabilities of most of us? And if people aren't needed to do the work, or incapable of it, how are they going to earn their keep?

Those are questions our political leaders are going to have to concern themselves about — and soon.

OUR SUBMISSIONS POLICY *We invite your feedback and ideas*

Service Truck Magazine welcomes submissions of letters, guest columns, short notices, product announcements, press releases, and ideas for articles. Send them to editor@servicetruckmagazine.com.

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Guest columns: These can be up to 700 words. Please send a brief note of inquiry first, however, just in case space what you wish to write about has already received a lot of coverage in our pages. Include your full name, the city or town you live in, and a contact phone number.

Short notices: Tell us about individual promotions, appointments, awards, staff movements, plant openings, plant closures, expansions, and other milestones. These short items should be no longer than 100 words.

Product announcements: Are you a supplier to the industry? Has your company developed a new product or process? If possible, attach a photograph.

Press releases: These should have something to do with service trucks and mechanics trucks in North America. We might publish only part of a press release or use it as starting point for an article by one of our writers.

Story ideas: Maybe you have an idea you'd like us to explore for an article. A good rule of thumb is to limit your story idea to no more than 30 words. If it takes longer than that to describe it, then chances are we won't be able to take it on.

All submissions are subject to editing and publication cannot be guaranteed. The deadline for our next issue of Service Truck Magazine is Dec. 14, 2016. Sooner is always better than later.

About our cartoonist

Nelson Dewey has been a prolific cartoonist for over 50 years. If his work looks familiar, maybe you read a lot of car comic books when you were younger.

In the 1960s, '70s and '80s, Dewey was a frequent contributor to those comics, particularly *CARtoons*. He also drew for *Hot Rod Cartoons*, *CYCLEtoons*, *SURFtoons* and *SKItoons*.

To see samples of Dewey's car cartoons, go to his website, www.nelsondewey.com.

NEWS

Greasy Guidelines

continued from cover

"Oil makes up 90 percent of most greases," Tucker said. "And oil is what generally does the lubricating. The other 10 percent is thickeners and additives. The thickeners are there simply to hold the grease against the bearing or wear surface so oil can bleed out and lubricate things. Just because a grease is sticky on your fingers doesn't mean it does a better job in a machine."

Greases come in variety of colors that have little to with their formulation or use. *Photo by Dan Anderson*

Certain labels reference thickeners

When greases are labeled as "lithium," "lithium-complex," "clay," or "polyurea" it refers to what sort of thickener is used to "carry" the oil that is the actual lubricant in the grease. Moly and graphite, on the other hand, are actual lubricants added to those types of greases for the special performance they provide.

Moly grease is used extensively in heavy equipment because of its ability to withstand extremely high pressure. Many pivot pins and bushings in loader booms and buckets never turn full revolutions while lifting immense weights. The grease in the pinch points on those pins never gets circulated like the grease in a rotating bearing. Moly additives allow those greases to withstand repeated loadings of immense pressure without losing their lubricative qualities.

Compared to the punishment endured by moly greases in pivot pins, the grease used in standard rotating ball or roller bearings would seem to have an easy life. "Easier" is a relative term because the entire purpose of a grease is to keep moving metal surfaces from trying to destroy each other. Optimum performance of any grease depends on the operating environment (dusty, wet, high-vibration, etc.), the metals in the components the grease is protecting, and the operating temperatures.

Engineers do extensive testing to determine the best grease for a particular application. Intentionally or accidentally using a non-recommended grease can have expensive consequences. For example, chemists with a large lubricant manufacturer were challenged by a farmer/customer who had trouble with bearings in his haying equipment that repeatedly failed for no apparent reason.

Extensive testing eventually determined that the farmer was using the correct type of grease for the application, but had mistakenly used a heavier grade of grease than recommended by the equipment manufacturer. The farmer had assumed that a heavier, stickier grease was "better" than the thinner, more liquid grease recommended by the manufacturer. The chemists at the lubricant manufacturer determined that the heavier grease wasn't circulating within the farmer's equipment's bearings, causing them to overheat and fail.

Grease has its cool side

While the primary purpose of grease is lubrication, cooling is also a critical role. If a grease is too "thick" to circulate, it doesn't transfer heat away from moving parts and can overheat bearings and lead to premature failure. When the farmer switched to the thinner grade of grease recommended by the machine's manufacturer, his problems with bearing failures disappeared.

Finding a grease of recommended thickness is as easy as reading the outside of the grease cartridge or container. Greases are rated according to their thickness and resistance to flow by the National Lubricating Grease Institute — NLGI for short.

NLGI grease ratings range from semi-fluid NLGI 000-consistency grade up to rarely seen NLGI 6-consistency grease, which is nearly solid and commonly called "brick grease." Greases in the NLGI 2 range are most commonly found in mechanic's grease guns and recommended for general use in common mechanical applications.

Aside from NLGI consistency ratings, grease users must select from a variety of thickeners and additives. For decades, lithium was the thickener of choice for general mechanical lubrication, but polyurea has slowly gained popularity. Polyurea greases are now the factory-fill grease on most major auto, agricultural and heavy equipment assembly lines. Lithium and polyurea greases are reasonably priced and work well under a wide range of temperatures, pressures, and rpms.

Take care with clay-based greases

Clay-based greases resist heat very well. However, if used in the wrong situations, and especially if not replenished as frequently as recommended in owner's manuals, clay-thickened greases can cake and leave a thick, non-lubricating residue after all their lubricating oil has bled out. Clay-based greases should be replenished until fresh grease purges from the pin or bushing to ensure all the old, depleted carrier has been replaced.

As mentioned earlier, grease with molybdenum and graphite additives are preferred for non-rotating assemblies and areas under intense pressure. The moly and graphite additives are themselves lubricants, providing protection if the oil component of the grease is squeezed out by intense pressure.

Ultimately, you can't judge the prospective performance of a grease by its color, or by the way it feels when pinched between finger and thumb. But you can predict how well a grease will lubricate mechanical components by the thickeners, additives and NLGI ratings listed on the side of every container or tube of grease.

Grease by the numbers

The following table describes the characteristics and uses of various greases by their National Lubricating Grease Institute classification numbers.

NLGI number	Use/Characteristics
000	Pourable grease; flows like molasses; used in industrial applications for single-point lubrication where grease is pumped through hundreds of feet of lube line.
0	Pourable grease; cotton picker grease or applications that use "lube lines" to lubricate a machine from a single "multi-luber."
1	Corn head gearbox grease, commonly used in agricultural gearcases.
2	Most common grade of grease for agriculture and general industrial/construction equipment maintenance; often used in wheel bearings, steering components, and general bearing lubrication.
3	Used in heavy construction equipment under under extreme loading or requiring extra sealing capability.
4	Severe-duty industrial grease rarely used in agricultural or general construction equipment
5	Severe-duty industrial grease. So thick it's applied rather than pumped.
6	Known as "brick grease," it has consistency of modeling clay. Rarely used in ag.

Note: It is detrimental to use a grease heavier than specified by the manufacturer for a given application. Using a heavier grease than recommended creates a braking effect, increasing fiction. Heat build-up can occur due to "churning" of the heavier grease, and also because the heavier grease does not flow enough to transfer heat from the inner bearing race to outer bearing housing where it radiates to atmosphere.

COVER

Research reveals "visual chaos" in service truck warning lights *continued from cover*

ligent Warning Lights and Driving Safety," by Dr. John Bullough, an adjunct faculty member and the director of transportation and safety lighting programs at the institute's Lighting Research Center. That paper offers suggestions on how the use of warning lights and beacons can be improved on service-related vehicles by addressing things like maximum luminous intensity, modulation characteristics, and the number of lights used.

"This issue has been studied in piecemeal over many decades, but our project is one of the first attempts to systematically investigate how lights can work together to provide information to drivers to help worker safety," Bullough explains.

Brighter not necessarily better

The importance of (and need for) warning lights and beacons on service vehicles is not in question, but Bullough points out that getting the attention of other drivers is only the first job of these lights. He explains that all lights on service vehicles need to have a certain intensity level to adequately warn other vehicles of their presence. But the use of brighter, more intense lights may actually make it more difficult for other drivers to navigate through an incident scene on the roadway. That in-turn can make workers less safe by creating glare and/or a scenario that Bullough describes as "visual chaos."

"Twenty years ago, meeting the lighting standards for service vehicles was a challenge," says Bullough, adding that the study's findings have been presented to various industry associations and boards, as well as the New York State Department of Transportation. "However, there is more energy and light to spare thanks to advances in lighting technology. So there is now a potential for overkill by making lights too bright."

The Society of Automotive Engineers, a.k.a SAE, actually publishes standards on the required intensity, color, and flash rates for warning lights. However, Bullough says there are other things these standards do not cover, such as an upper limit on intensity to control for glare, or how multiple lights can be coordinated to help eliminate confusing and distracting environments that can negatively impair other drivers.

"Basically we found that peak intensities of warning lights should approach 1,000 candelas to make sure they can be detected in the daytime in complex urban environments, but this may be too high for nighttime conditions when they can create glare. This is especially the case when there is fog, or snow, which makes glare worse," explains Bullough, who says the researchers also discovered it is easier for other drivers to judge distances and slow down sooner if warning lights flash in a high/low pattern, as opposed to an on/off pattern. "We are also learning that when multiple lights are used, flashing them in-sync, or in a sequenced pattern can be helpful, as it helps give drivers better guidance on what to do."

"This issue has been studied in piecemeal over many decades, but our project is one of the first attempts to systematically investigate how lights can work together to provide information to drivers to help worker safety."

— Dr. John Bullough, director, Lighting Research Center, Rensselaer Polytechnic Institute

Dr. John Bullough of the Lighting Rsearch Center at Rensselaer Polytechnic Institute has been studying the use and impacts of work truck warnings lights for three years.

How to improve service vehicle warning lights

Based on research at the Rensselaer Polytechnic Institute's Lighting Research Center, here are some preliminary specifications proposed to improve the performance of warning lights and beacons on service vehicles:

- **Maximum luminous intensity** – Recommends 530 candela minimum (daytime) and 180 candela minimum (nighttime); these values should prevent glare at night, while ensuring optimal response times for both daytime, and nighttime situations.
- **Modulation characteristics** – Recommends a 10:1 ratio between the maximum and minimum intensities while flashing; this ratio will provide improved closure detection over a source with on/off flashing.
- **Spatial extent** – Recommends a minimum of two beacons be used; this will result in improved closure detection over use of just a single warning beacon.
- **Show direction** – When lighting is intended to convey a sense of direction (like changing lanes), animated, sweeping-type signals provide more meaningful visual cues and prompt earlier lane changes, as compared to conventional flashing lights.

More trials coming

The study, now in its third year, is transitioning into more field trials that will include at a test track at Penn State University. Even though Bullough says no lighting standards have been re-written yet as a result of the work, he hopes the results of the experiments will eventually help end-users adopt practices that create safer work environments.

"We do not want this information to sit on a shelf and not get used," Bullough says. "This is why we want to come up with solutions that are doable and practical for people in the field."

Mark Yontz is a freelance writer from Urbandale, Iowa.

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TECHNOLOGY

Leverage big data for big results in a vocational work truck fleet

The days of figuring it out with Post-it notes and Excel spreadsheets are over

CHRISTOPHER LYON
SPECIAL TO SERVICE TRUCK MAGAZINE

One of the biggest challenges facing fleet managers is how to specify work trucks that will help their operations increase output and productivity in spite of declining budgets and reduced resources.

Since most vocational trucks are not mass-produced, fleet managers often have just one opportunity to design an efficient vehicle for their fleets' specific needs, or be plagued with an inefficient truck for several years.

The days of figuring it out with Post-it notes and Excel spreadsheets are over. Businesses are moving on from what has worked in the past and are coming to rely on big data to make strategic decisions. Accurate, well-analyzed data can enable fleet managers to make decisions based on real-world and real-time information.

About basic data

To begin, one must have a data source. For most fleet managers, this will be the operation's fleet information system, which stores vehicle maintenance, repair and fuel consumption data. At this basic level, the fleet manager can start looking at repair trends, component failures and overall asset usage. Based on any trends identified in this data, the fleet manager can make some top-level design decisions for the fleet's next work truck.

Beyond traditional data


Christopher Lyon

Fleet managers today have access to technology their predecessors could only dream of. Data loggers, telematics, onboard diagnostics and advanced vehicle locator — AVL —systems provide real-time operational information. These systems track vehicle speed, engine loads, engine RPMs, hard stops and rapid accelerations, fault codes, and much more. This technology has matured over the past several years, making it possible to access data almost seamlessly through a data link or radio integration system. With their vehicles' unique data, fleet managers can design work trucks specific to their operational requirements and environments. This data can also serve as a cost justification tool when matching the right technology to the right application.

Drive and duty cycles

Understanding the difference between drive cycle and duty cycle is the first step in measuring how a fleet's vehicles operate. These terms are often used interchangeably; however, each is a different metric.

A drive cycle measures and defines how a vehicle operates. It includes the following factors:
- average speed;
- maximum speed;
- idle time;
- power export time; and
- continuous running time per cycle.

A duty cycle defines how much a vehicle is used, including the following:
- hours of use per day;
- days of use per week;
- total miles driven per measurement cycle;
- percentage of on-road versus off-road driving; and
- loaded versus empty usage.

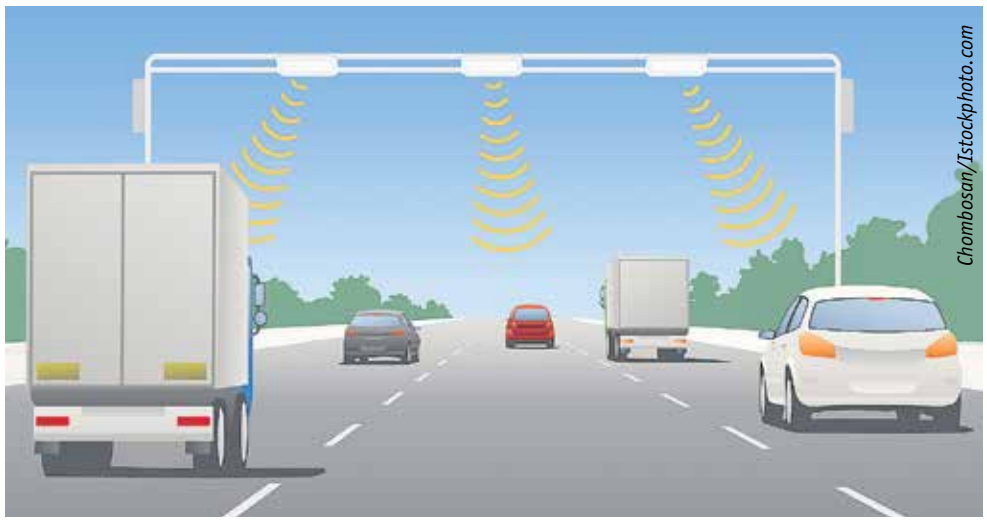
Understanding drive and duty cycle data will provide fleet managers the information they need to design appropriate work trucks. For example, an analysis might identify whether there would be sufficient return on investment for E-PTO worksite hybridization, or the use of other advanced/alternative technology. It's important to consider seasonal changes that may affect a fleet's drive and duty cycles, as well.

Telematics and efficiency

Telematics is often thought of as a GPS tracking system; however, when properly leveraged, it can be so much more. Information provided from telematics can give fleet managers the tools to streamline many operations, including routine maintenance scheduling, real-time vehicle utilization and improved routing.

Telematics can be used to increase the efficiency of fleet operations through route optimization. Driving fewer miles burns less fuel, a savings that directly impacts the bottom line. In a delivery fleet application, inventory and weight management can be as simple as scanning a barcode while loading vehicles to avoid overloading trucks.

In addition to these basic benefits, telematics also can provide information for long-term planning. By leverag-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Fleet managers today have access to technology their predecessors could only dream of.

ing specific drive- and duty-cycle data, fleet managers can design vehicles that match their operational environment. For example, vehicle speed data can be used in determining whether increasing aerodynamic efficiency will provide sufficient return on investment. Improved aerodynamic designs can be an effective option for vehicles operating primarily at highway speeds, but if a fleet's data shows new vehicles will be operated at low speed a majority of the time, investing in aerodynamic designs for those applications may not provide sufficient benefit to justify the cost.

Process improvement

Data also can be used as a process improvement tool. From the moment vehicles leave at the beginning of the day, they are almost entirely in the hands of the operator. It is commonly accepted the way a driver operates a vehicle can impact overall costs. Drive cycle data gives fleet managers the ability to tailor custom training programs and engage in driver behavior modification where needed. Sometimes just making drivers aware of the cause and effect of how they operate vehicles can be incentive enough for them to change bad habits. Other situations may require a more hands-on approach, such as real-time feedback or incentive programs.

Driver behavior modification can produce viable benefits, such as the following:

- reduced crash incidents;
- improved fuel economy; her working
- extended brake life; and
- reduced engine and transmission wear.

Pairing these strategies with a data-driven vehicle design can compound a fleet's savings in acquisition and operating costs.

One of the greatest benefits of data is that it does not lie. However, it's important to be aware of bad data. Incomplete or unreliable data can be the basis of undesirable and costly results. With all technology, the results can only be as good as the input data. Additionally, if data is not used, it becomes useless.

Want to learn more?

For additional information on these issues and others facing fleet managers, attend The Work Truck Show 2017 and Green Truck Summit, March 14–17, at the Indiana Convention Center in Indianapolis, Ind. Sessions begin March 14, and the exhibit hall is open March 15–17. Educational sessions will include guidance on how to efficiently specify vehicles, leverage telematics solutions to maximize benefits, and identify and mitigate vehicle risks for vocational truck fleets. For more details about these events, visit worktruckshow.com.

Christopher Lyon has served as director of fleet relations for the NTEA, the Association for the Work Truck Industry, since 2015.

CTEA WRAP

Equipment manufacturers hold their annual conference

U.S. economy looks strong, Canada's a little weak, but prospects bright for equipment makers, keynote speaker tells attendees

KEITH NORBURY

Safety innovations, the economic climate, and technological innovations for addressing concerns about climate change were among the topics addressed at the 53rd annual Manufacturers' Technical Conference of the Canadian Transportation Equipment Association.

The conference — held Oct. 24-26 in Vancouver, B.C. — drew about 160 attendees, including guests of the association such as the presenters and journalists, said association executive director Don Moore.

He was pleased with this year's event — which took place at the Four Seasons Hotel in downtown Vancouver and at the B.C. Institute of Technology's campus on Annacis Island.

"To be honest, I haven't even heard complaints about the weather," Moore said, referring to Vancouver's notorious liquid sunshine, which drizzled throughout the event. "Mind you everybody's been so intent on the conference that I don't think they really are too worried about it."

Town hall kicks it off

In particular Moore was pleased that Transport Canada again had representation at the conference after being absent from the 2015 conference in La Malbaie, Quebec. This year, Jean-Léon Morin, head of recalls for Transport Canada, was one of the keynote speakers and also participated in a town hall session on the opening night of the conference. That session also included representatives from Environment and Climate Change Canada, Ontario's ministry of transportation, and the B.C. ministry of transportation and infrastructure.

Among the topics Morin touched on were the requirements for applying for a national safety mark, and discussions of the two types of safety and compliance recalls in Canada.

Other keynote speakers were Jo-Annie Fortin, a former Olympian synchronized swimmer; and Michael Burt, an economist with the Conference Board of Canada.

Other highlights of the event included the following:

- presentations by six truck chassis manufacturers — Peterbilt, Western Star, Isuzu, Kenworth, Navistar, and Freightliner;
- CTEA's annual general meeting and election of two new directors — Shannon Bell of Wheel Monitor Inc., and Stephen Vezina of Mailhot Industries Inc.;
- an export toolbox session by representatives of Export Development Canada, and the Business Development Bank of Canada;
- a presentation by Chuck Brodie of Meritor Wabco on commercial vehicle safety systems;
- a session by Brian McAuliffe of Canada's National Research Council on greenhouse gas regulations that are driving innovations in the aerodynamics of commercial vehicles; and
- a table top technical trade fair that was paired with gourmet food offerings and beverages.

"It's very good. I've really enjoyed it," said John Baiano, of Parker Hannifin, whose products include Chelsea brand power take-offs often found on service trucks.

Trade fair "spectacular"

Among the presentations he found most impressive were Meritor Wabco's on the safety systems of the future, and Morin's on the details about product recalls.

"And actually the dinner last night and the trade show, it was pretty spectacular," said Baiano, whose company was among the trade fair vendors.

In fact, he even did some business at the occasion.

"It was kind of a joint call that we made yesterday and they were here last night as well," said Baiano, whose territory is the Greater Vancouver region and Vancouver Island. "So there's a possibility we are going to get some more business out of this."

CTEA president Suzy Léveillé said, "It's always a challenge for us to upgrade our conferences year after year and to help us do that we always try to find beautiful locations that our members will appreciate."

She gave credit to Tim Woolley, vice-president of Falcon Equipment Ltd., for working with Jeremy Harrower, the CTEA's manager of technical programs, to arrange access to the BCIT motive power program campus on Annacis Island. That's where a full day of programs, including the OEM presentations, were held.

"They've done a great job at it and I'm sure our members appreciate it," said Léveillé, who is director of business development with CTF Trailers Ltd. of Ste-Anne-des-Plaines, Que. "I could see it because all the rooms were filled and question period afterwards was filled with questions and we had to stop because it was lunch time."

Even that lunch had a mechanical trades feel with the meals served from a food truck and then eaten on cafeteria tables encircling a massive Man diesel engine of a type used to power passenger ferries on the B.C. coast.

Among the presentations that stood out for Léveillé was the one by the Conference Board of Canada's Michael Burt, which was titled, "The New Normal: Canada's Economic Outlook in a Low Commodity World." While Burt pointed out that the global outlook is weak, he also noted some glimmers of hope — including the U.S. economy.

U.S. leads the way

"If you look at the developed world, they're the leaders, the strongest growth and obviously they're the biggest economy in the world," Burt said. "So this is very good news."

However, even that good news translates only into a projected growth rate of 2.5 percent in the next few years. That is well below the growth rate prior to the financial crisis.

The outlook for the Canadian economy isn't so great — 1.5 to 2 percent — because of weak commodity prices, such as for minerals and oil and gas, he said. But Burt still offered an optimistic outlook for the Canadian manufacturers of transportation equipment, such as truck bodies and trailers. Since the 2009 financial crisis, sales have risen 6.5 percent a year and are almost back to pre-recession levels — even with the closure of the Sterling truck plant in St. Thomas, Ont. For the next few years, Burt expects the industry's sales will grow by about 4.5 percent a year with much of that growth spurred on by spending on mass transit and other infrastructure.

"I guess my key takeaway for all of you would be yes, the Canadian economy is a little weak but if you look at the core demand drivers for your industry, they're generally fairly healthy," Burt said.

He also noted that the imminent retirement of baby boomers is going to create a shortage in the trades. That's a gap that programs, such as those at BCIT aim to fill.

Not only do students in the institute's diesel mechanic programs get to practice operating equipment such as mini-excavators, they can also practice on simulators. The latter were also made available to conference attendees.

"This is fantastic," said Chris English of Link Suspensions of Canada as he operated a simulated Caterpillar D8 bulldozer. "I haven't operated a dozer. I've done a front-end loader and an excavator but never a dozer."

English, who is based in Edmonton, said he appreciated the insight from the chassis OEM reps on their new makes and models. "Just having that access," he said. "And then the organization of the whole thing. I think it's very well put together."

Great exposure for B.C.

Falcon Equipment's Tim Woolley, whose company is based in the Vancouver suburb of Surrey, said having the conference in B.C. was a great way to expose the association's members in eastern Canada to what's happening in B.C. and the challenges it faces.

"I think it's great just for everybody to have that exchange, exchange ideas in a casual environment, or be it a formal environment," said Woolley, whose company had two class 8 trucks that it had upfitted on display at BCIT. "Either way the dialogue is what I find the most beneficial."

Woolley said he has been involved with the association since 2005 and has found it to be beneficial for his career development as well as "a great experience for us as an organization."

Peter Mol of Genius Solutions, an enterprise resource planning service provider, said that custom transportation equipment manufacturing is an important market for his company. That's why he also attended the conference last year and plans to be in Windsor, Ont., for next year's event.

What's unique about the transportation equipment manufacturing industry, Mole said, is that a lot of the motivation for developing new products is "tightly related with new government regulation" for green technologies, for example. "And as a result you see a very tight collaboration between government and private enterprise in a very good way," Mol said.

About the only drawback to the conference is that some of the sessions overlapped, which meant that attendees often had to make difficult choices. For example, the presentation by Export Development Canada and Business Development Canada coincided with the popular new products showcase.

"Maybe we'll have to rethink that and have it all by itself because it always does seem to draw," Moore said.

The 54th annual conference in Windsor is scheduled for Oct. 23-25, 2017.

Photos by Keith Norbury

Jean-Léon Morin, head of recalls for Transport Canada, talks during town hall to kick off the Canadian Transportation Equipment Association conference.

Michael Burt, an economist with the Conference Board of Canada, delivers a keynote address at the Canadian Transportation Equipment Association's annual conference on the "new normal" of a low-price commodity world.

Morgan MacKay of Commercial Equipment Co. Ltd. talks with Dennis Kugle of Power-Packer Inc., during the table-top technical trade fair at the annual CTEA conference.

Attendees at the annual CTEA conference enjoy gourmet food offerings during the welcome reception at Vancouver's Four Seasons Hotel.

Gord Law (left) of Partech Marketing Inc. drops by the Wheel Monitor Inc. trade fair display to chat with Richard Bell, Shannon Bell, Eva Bell, and Peter Stewart.

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BY DAN ANDERSON

SPEC MY TRUCK

One Man, One Truck

Roadside emergency service fits this Colorado tech's work ethic

The business model of Gabe's Emergency Road Service in Walsenburg, Colo. is simple: "Always answer the phone."

"It doesn't matter if it's 2 a.m. or if I'm out with the family," says 37-year-old Gabe Gallegos. "I always answer the phone. I'm just lucky that Chrissy, my wife, grew up in a trucking-related business. Her dad had a towing company, so she understands that's how we make our money."

The one-man (and one understanding woman) operation is literally based around a 2016 F450 Ford Lariat-edition service truck powered by a PowerStroke 6.7-horsepower diesel engine coupled to a TorqShift heavy-duty six-speed automatic transmission. An Iowa Mold Tooling (IMT) Dominator service body is his "shop."

"I don't have an actual shop," Gallegos says. "I specialize in emergency roadside repairs for truck dealers and fleets, like U-Haul, Penske, and FleetNet. If it's anything major and I can't fix it on the road, it gets towed to a dealership to be fixed. But 99 percent of the time I fix them on the road. It's mostly belts and filters and basic diagnostics. Lately I've been doing a lot of forced re-gens (a process that self-cleans the diesel particulate filter on Tier IV diesel engines)."

Gallegos does no air conditioning work, no welding, and has no need for a crane or even a vise.

"A vise is just a knee-buster when you're getting in and out of the bed," he says. "In the nine years I've been doing (mobile repairs), I've never once wished I had a vise on the truck."

But he had a list of necessities he wanted on the truck as he worked with Southwest Products, his IMT service body dealer.

"I specified a VMAC underhood, belt-driven air compressor to save space," he says. "I want a clean-looking truck, without stuff bolted to the top of the boxes. It's a rotary screw, comes with a seven-gallon storage tank, and we added another 10-gallon tank for extra capacity. I can have full flow of 30 cfm in 10 seconds. It's an amazing compressor."

Another necessity on Gallegos' "gotta have" list when ordering his new truck was illumination.

"I'm a 'light' guy," he says. "So much of my work is after dark that I've got to have good lights."

Southwest Products and IMT opted for "quality" rather than "quantity" of lights to deliver Gallegos the illumination he wanted. Six LED floodlights, two on the front of the service body, two in the middle, and two on the rear provide, "all sorts of light that I can aim where I need it." The only lighting change required after delivery was to the truck's back-up lights.

"I can't help it, I love LED lights," says Gallegos. "I swapped the factory back-up lights for LED lights, and now I'm totally happy."

> **"I'm a 'light' guy. So much of my work is after dark that I've got to have good lights."**
>
> **— Gabe Gallegos, Walsenburg, Colo.**

A couple special accessories accommodate the "mobile" aspect of Gallegos' rolling workshop. An amber-and-white emergency light bar improves roadside safety, and a Herd-brand Aero LT grille guard protects the truck from Colorado's numerous deer.

Hand tools and frequently used diagnostic tools are stored in the right-side compartments, away from traffic. A ReelCraft air hose reel in the right, rear compartment is accessed via a port on the rear wall of the right compartment. Steps and grab handles help him get in and out of the bed to access a 75-gallon diesel fuel tank for transferring fuel, two 10-gallon tanks for red and green coolant, and fully mounted tires for U-Haul trucks and trailers.

"At 2 a.m. I'm not going to mess with mounting and dismounting tires on the side of the road," says Gallegos. "I keep the most common wheels and tires ready to go all the time."

Gallegos outfitted his new truck's cab to offset the discomforts of 24/7 service. The Lariat-edition cab features heated and cooled leather seats along with voice-activated navigation and dashboard control systems.

"About the only accessory I had to buy was some Carhartt seat covers to keep the seats clean," he says. "All the other stuff in the cab is nice, but I'm still figuring out all the voice-activated functions."

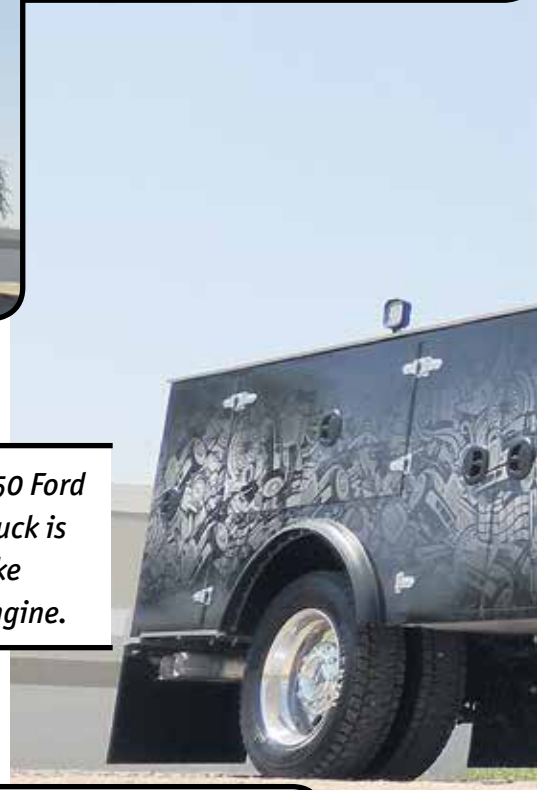
It took Gallegos 20 years to reach this point in his career. He started as a youngster tinkering with motorcycles and small engines, attended heavy equipment/diesel training school, worked at a Caterpillar dealership, and operated heavy equipment before he migrated to mobile emergency service and found his niche.

"I like being my own boss," he says. "I work a lot of hours, especially during 'moving season' from June through New Year's, then there's a slack time from January through May when I rest up. I don't miss shop work at all. I like the challenge of figuring things out on my own, under conditions that a lot of mechanics couldn't handle. It's just me and my truck, and we're getting along just fine."

Dan Anderson is a part-time freelance writer and full-time heavy equipment mechanic with more than 20 years of experience working out of service trucks. He is based in Bouton, Iowa.

IMT Dominator service body serves as his "shop."

Herd-brand Aero LT grille guard protects the truck from deer.



Gabe Gallegos's 2016 F450 Ford Lariat-edition service truck is powered by a PowerStroke 6.7-horsepower diesel engine.

Gallegos has since filled his truck with tools and accessories.

Emergency light bar improves roadside safety.

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Lariat-edition cab features voice-activated navigation and dashboard control systems.

Compartments provide plenty of space.

Gleaming tool chests are ready for action.

Left-side cabinets are for less frequently used items.

Steps and grab handles enable easy access to the truck bed.

ReelCraft air hose is accessed via a port on the rear wall of the right compartment.

Switches control lights at front, back and middle.

LED lights were on his to-do list.

ADVICE

Scraper maintenance necessary to keep earthmovers moving

Advice offered on daily and periodic procedures for keeping equipment on the job

SHANE KROEKER | SPECIAL TO SERVICE TRUCK MAGAZINE

Servicing and maintaining your earthmoving scraper is a necessary, yet unappealing activity. Earthmoving contractors want to be out in the cut, moving dirt, instead of doing a daily inspection while holding a grease gun. It is critical to protect your earthmoving equipment investment, and take pride of ownership of your scraper machinery. Become dedicated in completing a daily walk around and performing routine scheduled maintenance tasks.

It is important to continually track which maintenance items have been completed, as different operators may ride the same equipment when switching shifts. Use a maintenance checklist (either digitally or manually) to keep a record of all scheduled maintenance activities.

It is always wise to have a full set of replacement consumable parts for each scraper unit in the fleet.

"After a season of use, the earthmover should be thoroughly inspected and prepared for storage."

Take a daily walk-around

Complete an efficient daily walk-around of the scraper unit. Starting at the hook-up between the power unit and the scraper, make a continuous loop around of the machine.

At the front of the scraper, closely inspect the hydraulic hoses and couplers. Make sure that the hoses aren't cracked or worn and inspect the couplers for hydraulic oil residue leaks. Also, take a look at the hitch pin to confirm that the scraper machine is properly latched to the power unit.

Some scrapers may have many grease points, requiring an automatic lubrication system. For these intricate systems, ensure that the grease reservoir is at the appropriate fill level, and outgoing grease lines are puncture-free. Also take note of the manufacturer's specific grease requirements and be sure to use only that grease in the system (for example, SAE multi-purpose high temperature grease with extreme pressure).

Other scrapers have as little as one daily grease point, which may easily be done by a hand grease gun. Wipe grease fittings with a clean cloth before greasing, to avoid injecting dirt and grit. If fittings will not take grease, remove and clean thoroughly, including the lubricant passageway and replace any damaged fittings if necessary. Wheel bearings, for example, may only require an annual greasing, so make sure that an annual maintenance activity date is scheduled for those circumstances.

While continuing the scraper walk around, it is important to keep an eye on the consumable parts. Look down at the cutting edge and grader blades to check for cracks or dull edges. Using a worn-out edge will affect your pulling power and ease of loading. The extra strain on the machine and loss in loading efficiency is not worth riding out an insufficient cutting edge. Some scrapers have convenient fiber bushings at the pivot points of the machine. It is important to replace the bushing if the wear is more than one-eighth inch or every 1,200 hours (whichever comes earlier).

ADVICE

It is always wise to have a full set of replacement consumable parts for each scraper unit in the fleet. Downtime is costly and air shipping parts to your remote jobsite is not ideal. Contact your local dealer to purchase consumable parts to store on hand.

Another inspection point is being attentive to structural assembly stress fractures. If hairline cracking of welds or structural steel is spotted, be sure to tend to the trouble area immediately. It is critical that the structural integrity of the scraper is solid before proceeding, or you will run the risk of an expensive full assembly failure. Prior to welding onto your scraper, be sure to speak with the manufacturer for approved fixes or update kits.

About annual care

After a season of use, the earthmover should be thoroughly inspected and prepared for storage.

Start by thoroughly washing the entire machine using a pressure washer to remove all dirt, mud, entangled debris, or residue. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. Replace any hose that is badly cut, nicked, abraded, or is separating from the crimped end of a fitting.

Review all electrical wiring harnesses, and ensure that wires are not exposed and connectors are secured. Touch up all paint nicks and scratches to prevent rusting in cold weather. Select a storage area that is dry and level to park your earthmoving machine.

If the machine is able to work year-round in warmer climates, dedicate a full day for this annual inspection. At this time, contact your local dealer or the manufacturer to be aware of any update kits or advanced developments for your specific scraper model.

Maintenance should factor into the purchase decision when investigating the addition of a scraper to the fleet. Do not underestimate the time of maintenance inspections and repairs. Investigate marketplace options with minimal grease points and using advanced high-tensile steel to minimize stress fractures. Also be sure to have peace of mind in selecting a scraper with a multi-year structural warranty.

Shane Kroeker is vice-president of marketing at K-Tec Earthmovers Inc. For more information, visit www.ktec.com.

APPOINTMENT

Americas unit gets new boss

Palfinger has appointed Lennart Brelin as president of the company's consolidated Americas region, says a news release from Palfinger North America Group, which is headquartered in Niagara Falls, Ont.

Brelin will report to the executive board of Palfinger AG, the release said.

Vice-president Mark Woody will continue to lead Palfinger's Business Area North America while vice-president Ingo Erhardt will lead Business Area South America. Both will report to Brelin, the release said.

"With extensive market insight and industry experience in both business regions for more than 20 years, Brelin is uniquely qualified to successfully grow our business in the Americas region, while adding great value to our brand and ultimately to our customers," the release said.

Founded as a small family business in Austria in 1932, Palfinger is now made of 68 companies in 25 countries and has more than 9,000 employees. Its products include knuckle boom, material handling and service cranes, as well as mechanics trucks and service and truck bodies.

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Service trucks are assets, too *continued from cover*

copper prices were rendering capital dollars scarce for keeping the Highland Valley's large fleet of heavy equipment and vehicles up to date.

Frenks channeled his efforts into classic applied research. In the process, his thesis, "An Alternative Strategic Option in Managing Mine Mobile Asset Replacement," would help him earn a degree from SFU's Teck Executive MBA Program.

Mine provides study material

In his paper, Frenks describes Highland Valley as Canada's largest copper mine, with three open-pit areas, a giant metallurgical concentrator complex where ore is crushed, ground and processed, and an equipment repair shop.

While the mine has been busy, its enormous fleet of heavy equipment and vehicles has fast approached the optimal time for replacement.

"It would be beneficial to Teck Highland Valley Copper to understand if there is a more cost-effective alternative to straight-out asset replacement at predetermined asset lives," Frenks wrote, itemizing a lengthy list of assets, including graders, loaders, blasting trucks, rubber-tired bulldozers, mobile cranes, drilling rigs, an ambulance, fire trucks and 20 buses for ferrying workers.

Frenks singled out 240-ton Caterpillar 793 mechanical-drive haul trucks used to move ore and waste rock as a suitable proxy for all fleet categories. "If we can create an alternative strategy that works for the haul truck fleet, the other fleets would likely be candidates for a similar strategy," he explained.

While the Caterpillar 793 trucks date back to 1999, Frenks noted that age isn't necessarily the main determinant of something going wrong. While it's optimal to change components prior to failure and on a planned basis in order to minimize downtime and costs, usage and condition are the prime considerations.

"Year to year we look at what equipment can be pushed (kept operational) in order to postpone replacement and curtail the sustaining capital requirement," Frenks wrote. "This is not too difficult for a year or two, but many low commodity pricing environments last for five to ten years."

However, when a company delays equipment replacements for successive years without a longer-term strategy, operational capacity decreases because equipment requires ongoing maintenance. "The unintended consequence of pushing asset replacement is a reduction in capacity and an increase in repair costs," Frenks wrote.

Paper offers options

Frenks proposed two options for capital-strapped mine managers: To procure a single asset to maintain capacity in the short term, or — more cost-effectively in the long-term — to execute a targeted precision rebuild of the asset in order to maintain capacity.

Analyzing factors such as the manufacturer's recommended operating life, average costs to repair and rebuild equipment, and the projected life-span of a particular mine, Frenks compared costs associated with replacing six older trucks.

"In the case of HVC, we are already looking at pushing our mine life out to 2040 and therefore (a) short-term strategy would not fit well with the long-term resource plan we are developing," Frenks wrote.

One strategy Frenks identified would take a single truck out of service for a rebuild, keeping the rest in service. "In order to ensure we do not adversely affect the mine operation's hauling capacity, we would purchase one new 793 haul truck to maintain capacity throughout this process. With the new 793 haul truck in service, we would then look at taking the next five oldest trucks out of service one at a time and perform a targeted rebuild on each unit."

The question, Frenks explained, is whether it's more cost effective to purchase six new trucks or to purchase one new truck and perform a targeted rebuild on five old ones. The answer, he suggested, comes down to good planning and thoughtful re-use of components.

"Mining companies have rebuilt haul trucks in the past and the first lesson learned is that the sum of the parts adds up to more than the cost of the haul truck," Frenks wrote. "Here is where precision must come into our execution.

The Highland Valley copper mine is near Logan Lake, B.C.
Photo courtesy of Teck Resources Limited

"Underfoot conditions are changing all the time in a mine. What may be a fairly smooth haul for a 240-ton truck is a very aggressive haul for a service truck."
— Nick Frenks, MBA thesis author

We must only perform the targeted work planned and be precise in execution in order to keep the costs in line. That means that when we remove our components during the tear down, all healthy components will be re-used. If we target properly and are precise in our execution, this may become the alternative to asset replacement."

Beware of capacity shortfall

In the short term or for a mine nearing the end of its life, a single asset can be procured to guard against capacity shortfall. However, Frenks wrote, this can only occur until the shortfall in availability equals the capacity of the additional haul truck. Then, a mine must consider purchasing another haul truck to again guard against a capacity shortfall.

"This is indeed only a short term solution as the increase in fleet size and operators will be cost prohibitive in a longer term situation," Frenks explained.

In the longer term or increasing life of a mine, Frenks concluded that the targeted precision rebuild of current mobile mine assets will ensure capacity can be maintained while providing a long-term, cost-effective solution to mobile asset replacement.

In an interview, Frenks told *Service Truck Magazine* that the goal is keeping assets running smoothly to maximize availability and efficiency, all while weathering market fluctuations.

"Your fleets are aging and you're forecasting when you're going to change your fleet over. But all of a sudden your capital is dwindling away. What do you do?"

His question was rhetorical. "If you do nothing you lose capacity," he reasoned. "If you keep saying 'Next year we'll buy,' all you've done is lost capacity without doing anything. There should be more than one strategy for how you handle your assets, depending on where you are in your business cycle."

Study listed service trucks

While Frenks used Caterpillar 793 haul trucks as a proxy for all fleet categories, he listed 20 lube/fuel/service trucks in Teck's overall Highland Valley fleet, and says they're highly vulnerable to wear and tear in a mine environment.

"Underfoot conditions are changing all the time in a mine," Frenks explained. "What may be a fairly smooth haul for a 240-ton truck is a very aggressive haul for a service truck."

Of course, symptoms differ. Wear and tear on a haul truck often shows up in cracks, whereas on a service truck the mounts generally break first, Frenks said.

Whatever goes wrong with a service truck, Frenks said, if you don't identify it early on and get it under control, you'll probably retire the vehicle early because it will gradually become too expensive to maintain.

"It's no different than using a service truck in the lumber business or on a lumber road," Frenks said. "You need to identify what's affecting the truck."

Sometimes the answer is a simple fix. A stressed out stress riser might benefit from cushioning to protect against further wear, or beefing up the area so stress is pushed to other areas of the frame.

Ultimately, Frenks said, fleets can be maintained cost-effectively through condition-based asset monitoring. "If you find out what's taking your fleet down, start to put in some key performance indicators and start measuring those."

Frenks chose to focus on haul trucks because that's where the mine's bottleneck was at the time he did his research. But bottlenecks can change. Tomorrow, it could be drills or shovels.

"If our mine plan changes and we haul less waste and less ore, our focus may move over to the mill, and then we'll pay attention there. I'll take what I learned and try to find the same changes there."

Saul Chernos is a writer based in Toronto.

SHOW WRAP

Service trucks and mining: Project forecast is mixed

With the easy prospects exploited, miners are going deeper and to more remote areas

SAUL CHERNOS

Wherever there's a working mine, or even one under development, there's likely to be a service truck working behind the scenes.

The 2008-2009 recession coupled with the more recent fall in commodity prices have challenged a sector that has traditionally weathered rocky boom-bust cycles. While the oil patch has been particularly stressed of late, conventional metal mines have also been hit hard.

At Mines and Money Americas, a trade show held in Toronto in late September, there was considerable buzz around the economic prospects for exploration and extraction. These early-stage activities are almost uniformly undertaken by juniors and are a logical place to begin probing the financial health of the mining sector because they represent what's down the pipe.

A case in point is Crown Mining, which is based in Toronto but has key exploration properties in Nevada for gold and California for copper. CEO Stephen Dunn told *Service Truck Magazine* that the two metals are in high demand, yet large institutional investors are increasingly risk-adverse to support exploration because it can take decades to complete engineering studies, get permits and advance projects so they're ready for a senior mining company to undertake extraction.

"The seniors have money, but the juniors can't get the funding to develop their projects," Dunn said, describing juniors scrambling to find investors and funds that recognize the business and its challenges and can anticipate eventual returns.

Costs mount in remote areas

Kendra Johnston, corporate development manager with Vancouver-based Independence Gold Corp., has worked as a geologist in western Canada and in Nevada and says exploration can be time consuming and costly, especially in remote areas.

"It's people hours primarily, and in this jurisdiction it's camp support, helicopter time and transportation," Johnston said. "You have to get community engagement everywhere, and it takes time."

Commodity prices are a key economic driver, but Johnston said companies hoping to provide goods and services to mining companies also need to understand jurisdictions and geography.

"Our business is getting more and more difficult," Johnston said. "The easy prospects and deposits have been found and we're now looking deeper and more remote."

Still, Johnston sounded hopeful. "The markets are starting to turn around again and the money's starting to flow back in," she said. "It allows us a little bit more freedom to get out and do some of the things we've been thinking about and planning."

David Frost, senior vice-president of process engineering for North America for Oakville, Ont.-based DRA Americas Global, said he anticipates precious metals will continue to rise so long as investment in hard currency remains strong.

"People are afraid of the stock market after the last few crashes," Frost said. "I think people are going into either bricks and mortar in housing or into precious metals."

However, Frost expressed a more muted optimism for other resources. "It's very slow time for nickel and copper and stockpiles are high. I don't think you're going to see much better days until maybe next year."

With the economy tight, Frost said mining companies are cutting costs wherever feasible, with some even using smaller cranes rather than overhead cranes in order to achieve efficiency and savings. "Some companies might use boom cranes carry out maintenance on equipment such as tanks, agitators and flotation cells," Frost added.

Service trucks bolster bottom line

The same logic applies to service trucks, with efforts made to keep inexpensive parts on hand and in good supply, Frost said, adding that he's not directly involved in fleet management.

Elsewhere in this issue, *Service Truck Magazine* reports on efforts undertaken by Nick Frenks at Teck Resources Limited to optimize the maintenance and purchase regimen for service trucks and other heavy equipment.

Well, head office has noticed. In a speech at the conference, Teck's chief financial officer Ron Milos emphasized that the bulk of his company's cost savings have come from these kinds of productivity improvements.

Milos cited efforts to reduce the time it takes to load and later unload haul trucks. "Over a year it adds up to a large amount," he said. "You end up parking trucks. It saves maintenances and fuel."

He also singled out changing maintenance practices. "When we bring a haul truck into the garage for preventative maintenance it normally takes 16 hours," Milos said. "Well, a shift is 12 hours, and they've figured out how to reduce that maintenance time to one shift. There are about 400 initiatives we're working on, from thousands of dollars to tens of millions of dollars, in our cost reduction control program."

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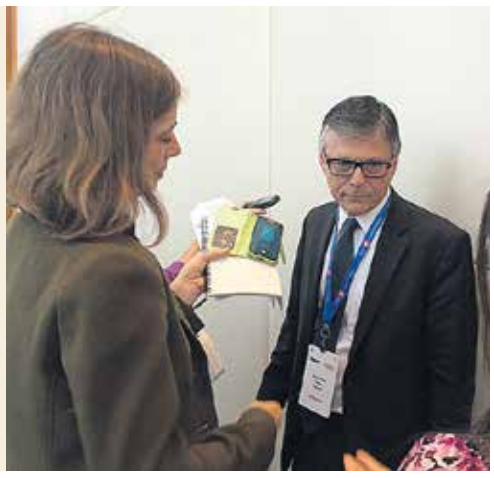
— Ron Milos, chief financial officer, Teck Resources Limited



Financial analysts also expressed cautious optimism. In an interview, Don Coxe of Coxe Advisors said precious metals are faring well, in part due to the economic slowdown. "Our view is that we're going to have a recession," Coxe said. "It will probably not be a deep recession, but we may come out of it and not know we're out of it because of this zero and negative interest rate environment."

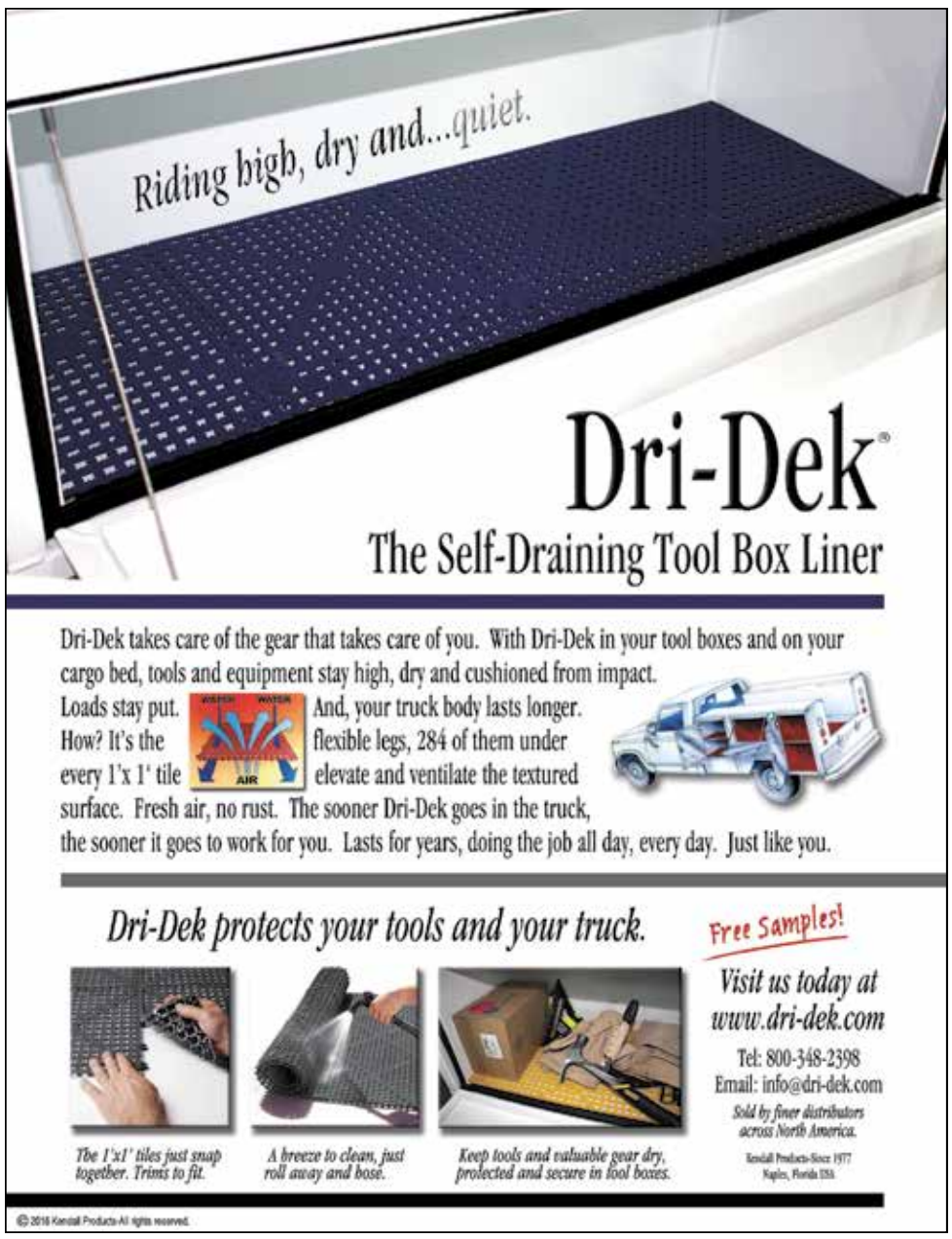
"Our business is getting more and more difficult. The easy prospects and deposits have been found and we're now looking deeper and more remote."

— Kendra Johnston, corporate development manager, Independence Gold Corp.

Precious metals hold promise

The result for mining, Coxe said, is that precious metals such as gold and silver are ironically among the few industries that don't benefit from high interest rates. "If you own a bar of gold or silver coins in the past you gave up interest to own them, but now with zero or negative interest rates … it's no surprise that the two best performing assets this year have been gold and silver," Coxe said. "And if we have a recession they will once again be the best."

If recessionary times indeed return, or commodity prices remain low, there might be work in northern Canada. Northwestern Ontario's Ring of Fire is still at the exploration and development stage, but proponents tout the region as mineral-rich, with billions of dollars in potential but requiring further



"Our view is that we're going to have a recession. It will probably not be a deep recession, but we may come out of it and not know we're out of it because of this zero and negative interest rate environment."

— Don Coxe, Coxe Advisors

Alan Coutts of Noront Resources Ltd. addresses the recent Mines and Money Americas trade show.

negotiation with Aboriginal communities and governments.

If the necessary approvals come though, little of any significance can happen if road, rail lines and hydro corridors aren't built. Their construction would require all manner of heavy equipment.

Exploration and development companies, meanwhile, are biding their time, readying for the eventuality that they do get the green light.

Alan Coutts, CEO of Toronto-based Noront Resources Ltd., said his company has continued exploratory drilling and feasibility work at its Eagle's Nest deposit and bought out two major competitors in the region — Cliffs Natural Resources and MacDonald Mines.

"It has allowed us to consolidate virtually the entire region," Coutts said, touching on plans to eventually build mineral processing facilities.

"We're working very closely with the provincial government and the local First Nations," Coutts said, adding that it makes sense to bundle regional infrastructure development on the back of the industrial development. "This is a model that's gaining popularity and traction throughout Canada," he added.

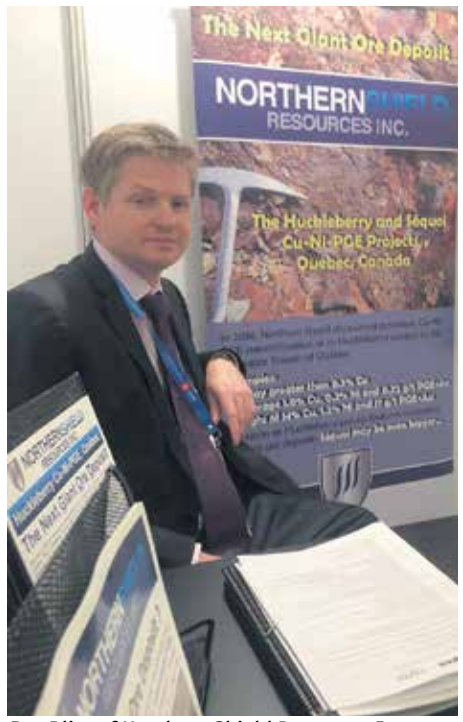
Search on for base metals too

In northeastern Québec, Northern Shield Resources Inc. is actively looking for nickel, copper, and platinum. "There's some potentially large-scale deposits," president and CEO Ian Bliss said in an interview.

Areas near Schefferville are served by a railway south to the St. Lawrence Seaway, but the Quebec government is planning on pushing that railway further north up towards Kuujjuaq with the purpose of developing and opening up mineral exploration, Bliss said.

There's also the Northwest Territories. In a speech, the territories' industry, tourism and investment minister Wally Schumann said mining is brisk, with giants like De Beers and Rio Tinto contributing nearly $2 billion annually in diamond production, making the Northwest Territories the world's third largest producer of diamonds by value.

"Yellowknife is known as the diamond capital of North America, and by all accounts there's more to come," Schumann said. "Only a fraction of the territory has been explored, and projects have identified copper, silver, iron, tungsten, zinc, nickel, lead and rare earths. It's an impressive inventory and we have the supply."



Ian Bliss of Northern Shield Resources Inc. says northern Quebec has potential large-scale deposits of nickel, copper, and platinum.

Schumann, who also oversees the government portfolio for transportation and public works, said that while the recession has moderated activity, the territories' economic future depends on its ability to develop highways, fiber-optic links and other transportation and communication infrastructure.

"As a government we're making strategic infrastructure investments so we can grow a strong diversified economy," Schumann said. "That includes infrastructure to support economic growth, prepare for natural resource development, connect our communities and increase access to central business services."

Saul Chernos is a freelance writer based in Toronto.

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NEWS

ConExpo promises more education

The triennial ConExpo-Con/Agg heavy equipment trade show in Las Vegas next March will offer a record 143 educational sessions, says a news release from the show organizers.

Those sessions will take place across 10 tracks, including a new technology track, the release said.

"The technology track complements the new 75,000-plus square foot Tech Experience showcasing the ideas and technologies that will transform construction in the future," the release said.

Education tracks also offer the latest trends and best practices in such areas as cranes, rigging and aerial lifts, equipment management and maintenance, workforce development skills, and safety and regulations.

The show itself, taking place March 7-11, 2017 at the Las Vegas Convention Center, will feature a record 2.5 million net square feet of exhibits. Attendance at the 2014 show was just under 130,000.

Service Truck Magazine will be among the 2,500-plus exhibitors. Look for us in Booth S60226 in South Hall 1.

For more information on CoNExpo, visit www.conexpoconagg.com.

Gerald Thurn and Kevin Vetter of Anderson Western asphalt paver from Bismark, N.D., check out a lube skid package at the Tiger Cranes booth at ConExpo 2014 in Las Vegas. *File photo by Keith Norbury*

Truck sales plummet in July

Commercial truck sales in the U.S. and Mexico dropped 13.3 percent in July 2016 compared with July 2015, according to the October monthly OEM chassis report from the National Truck Equipment Association.

A 24.2 percent slide in the conventional cab segment triggered the decline, the report said.

For Canada, the sales drop was 15.6 percent year over year.

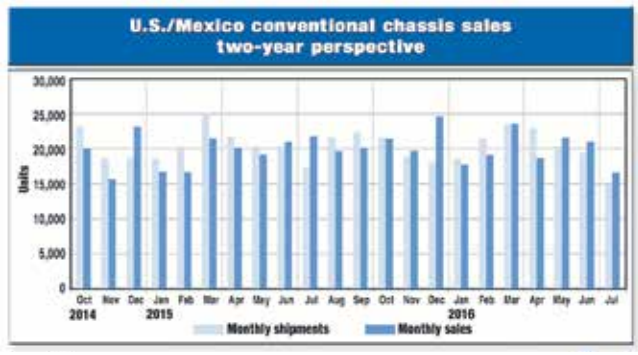

Chart in NTEA's October OEM chassis report tracks convention chassis sales in U.S. and Mexico over the least two years.

A large increase in cutaways wasn't enough to offset the "substantial declines"in the conventional, strip, and low cab-over-engine segments.

NTEA members can access the 12-page report for free from the association's website, www.ntea.com.

Association updates website

The NTEA — the Association for the Work Truck Industry — has updated its website "to streamline the user experience and provide a responsive layout," says a news release from the organization.

Among the key changes to the site are a responsive redesign for mobile use, intuitive functionality, social mediation integration, and refined search tools.

"We are constantly seeking to evolve and enhance the access to our products and services, and this site reflects that commitment," the release quoted NTEA executive director Steve Carey.

The site has a more comprehensive member directory that can also serve as a customized marketing tool, the release said.

Users of Internet Explorer 11 or earlier versions of the browser might find that the revamped site doesn't function to its full potential. So the NTEA recommends upgrading or using another browser.

The site is at www.ntea.com.

Body maker seeks site for new plant

Truck body maker Morgan Corporation has begun searching for a site in the Midwest states to build a new plant capable of producing up to 3,000 truck bodies annually.

Morgan Corporation's products include Service Pro service bodies.

The company is looking for a site in Kentucky, Ohio, Indiana, or Michigan, said an Aug. 8 news release from the company, which is headquartered in Morgantown, Pa. The plan is to have the facility, expected to encompass 160,000 square feet and employ 175 people, in operation in early 2017.

"With a total of 12 facilities in the U.S. and Canada, we know that Morgan's proximity to its customers is an important part of improving customer service," the release quoted Norb Markert, Morgan's president and chief operating officer. "Our decision to operate a plant in the Midwest will enable Morgan to better meet the needs of its customers and to more aggressively compete in this strategic region."

Morgan specializes in class 3 to 7 box truck and straight truck bodies for the refrigerated and dry freight industries. However, the company also has a line of Service-Pro bodies that it unveiled at the 2015 Work Truck Show in Indianapolis.

Morgan is a subsidiary of Houston-based J.B. Poindexter Y& Co. Inc.

For more on the company, visit www.morgancorp.com.

Body maker names new California dealer

Maintainer Corporation of Iowa Inc. has a new dealer in the Golden State.

Maintainer products such as its HH225 model service truck have new distribution channels in California.

Based in Sheldon, Iowa, the manufacturer reached a deal with Nixon-Egli Equipment Company to sell Maintainer's equipment line, including lube and service trucks, throughout California, said a news release.

Nixon-Egli, which has provided equipment such as cranes to municipal customers since 1965, will focus on government agencies, the release said. The dealer, which represents such brands as Link-Belt and Wirtgen, has locations in Ontario and Tracy, Calif.

"Nixon-Egli has a long history of working with many state, county and municipal governments in California, as well as with construction contractors," the release quoted Tom Wibben, Maintainer's sales and service manager.

In a related move, Maintainer has enlarged the territory of Empire Truck & Trailer, a dealer based in Phoenix, Ariz. Empire, which has been a Maintainer dealer in that state since 2009, will now also work with dealers in 10 southern California counties as well develop relationships in Clark County, Nevada. Empire has three locations in Arizona and two in California.

For more information, visit www.nixon-egli.com, www.empire-tnt.com, or www.maintainer.com.

New compressor made for Fords

A new power-takeoff-driven rotary screw air compressor for Ford trucks has been launched by VMAC Global Technology Inc.

The DTM70 is for the Ford F-250 to F-550 Super Duty 6.7-litre Power Stroke diesel 4x2 and 4x4 work truck with TorqShift automatic transmission, said a news release from VMAC.

The compressor, which VMAC says is the first of its kind in the world, "mounts directly to the transmission, eliminating the complex and time consuming installation of traditional underdeck compressor systems," the news release quoted Gordon Duval, VMAC's vice-president of marketing and sales.

The DTM70 can produce up to 70 cubic feet per minute at a 100 percent duty cycle, enough air power to run a 90-pound pavement breaker or a one-inch impact gun, the release said.

It features, easy-to-use controls. By simply pushing the on-off button, "the PTO engages, the compressor turns on, and the throttle control automatically idles the truck engine up and down to match air demand."

A built-in heater automatically warms the compressor en route to a job site in cold conditions.

Installation is also easy and takes half the time as for traditional underdeck compressors, Duvall said.

"Traditional underdeck systems are extremely heavy, are challenged with ground clearance, and require modification of the Ford transfer case on 4x4 models, all of which adds up to significant time and expense for installers," he added.

Founded in 1986, VMAC, which stands for Vehicle Mounted Air Compressors, is headquartered in Nanaimo, B.C.

VMAC's new DTM70 rotary screw air compressor is designed for Fords with TorqShift automatic transmissions.

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MANUFACTURING

Tour reveals the colorful magic of Kentucky equipment factory

Plant's 750 workers shape materials such as plate steel into frames, superstructures, and booms

STORY AND PHOTOS BY KEITH NORBURY

Deep inside Link-Belt Construction Equipment Company's crane factory in Lexington, Ky., is a machine that works in seemingly magical ways more befitting a device in a Dr. Seuss storybook.

In fact, it's even called "the Cat in the Hat Machine," noted Mike Ogle, a district sales manager from Atlanta, during a tour of the plant.

The machine is actually a paint line for small parts, which are hung on hooks before disappearing into the machine.

"There's no bar codes," Ogle said. "There's nothing really signifying what part is what. But for some reason if it goes in, it comes out the color it's supposed to be. It could be blue, it could be red, it could be grey. But no one knows how it happens. So that's why they all refer to as the Cat in the Hat Machine."

Pre-painting of parts is an innovation Link-Belt introduced in the early 2000s. It requires more careful handling but prevents corrosion, paint runs, poor seals, and other issues that can arise from having bare metal contacting bare metal, Ogle said.

Triennel gathering draws a crowd

The tour took place during Link-Belt's most recent CraneFest, a triennial event the company hosts at the Lexington facility.

Nearly 1,000 people, including customers and a few journalists, attended the most recent CraneFest in the fall of 2015. Each of the four days of the event drew more than 230 participants, Link-Belt publicity coordinator Casey Smith said when it was all over.

One of those attendees was Sheldon Baker, president and owner of Canadian Crane Rentals Ltd. of Wingham, Ont. He rides his Victory Kingpin touring bike on an annual fall run through that part of the world and every third year piggybacks that ride with a pilgrimage to CraneFest.

"I've been down many times," said Baker, who has owned Link-Belt cranes since the 1980s. "What I like about them is every three years since they started with this CraneFest, they always introduce the new models. And the biggest thing I like about it is when you go through the factory, you see all the improvements."

The first CraneFest took place 20 years ago, Link-Belt's Bill Stramer — vice-president of marketing, sales, and customer support — said during introductions before a plant tour on the final day of CraneFest 2015.

Stramer admitted that the current iteration lacked the razzle dazzle of some earlier CraneFests — such as an eight-foot jelly doughnut and an old-time Kentucky outhouse "to demonstrate machine capacities." Nor did it have an Elvis impersonator or a Busch Grand National series race car.

But CraneFest 2015 did introduce three new Link-Belt machines and it featured plant tours that revealed details about how those machines are made. And the night before the tours, attendees were treated to a dinner and charity auction at Keeneland Race Course, the site of the 2015 Breeders' Cup horse races as well as the world's largest auction of thoroughbred race horses.

Three machines make their debuts

Among the new cranes making their debuts at CraneFest 2015 was the HTC-86110, an hydraulic truck crane that features a 164-foot main boom and a main boom tip height of 172.6 feet. The crane also comes with an optional one-, two-, or three-piece lattice boom fly. This patent-pending fly assembly has a new pinning system that eliminates the need for pounding pins into place, as Link-Belt project engineer JP Jones showed during a live demonstration inside the Link-Belt plant.

To erect the 35-foot section of the fly, Jones didn't need to start the engine to telescope the boom, explained Link-Belt spokesperson Susi Sivkov. Nor did Jones need a ladder or a hammer.

The two other cranes making their debut at CraneFest 2015 were the 100-ton 100RT rough-terrain crane, and the 140-ton TCC-1400 telecrawler.

The 100RT features a six-section164-foot pin-and-latch boom with over 172 feet of tip height and a working radius beyond 140 feet, Sivkov told a crowd who huddled on bleachers outside during a light drizzle. The RT100 also has optional on-board fly extensions, which are "interchangeable with several existing Link-Belt RTC and HTC models," says a company news release.

The new TCC-1400, meanwhile, boasts a job-site reach of 195 feet, noted Pat Collins, the company's director of product marketing. Its formed main boom has a tip height over 200 feet and a working radius of 185 feet.

Visitors enter bowels of Link-Belt

Major highlights of CraneFest were tours of the facility. While visitors weren't allowed to take photos in the production areas of the plant, Ogle painted vivid word pictures of how the factory's 750 workers shape materials such as plate steel into frames, superstructures, and booms.

CraneFest 2015 visitors check out the fly system on the new HTC86110 truck crane.

"We work a just-in-time process where we have enough material for probably the next two to three builds," Ogle said early in the two-hour tour. Plate steel for the large sub-assembly arrives pre-cut and is bar-coded so that welders can scan them before they begin welding. That enables production control to order new parts immediately.

The non-bar-coded parts that go into the Cat in the Hat Machine not withstanding, procedures at the plant follow a rigorous logic. For example, when a pre-painted bare frame comes down the assembly line, it does so upside down. "The reason it comes in upside down is it's a lot easier to run your hydraulic lines, your wiring harnesses, (and) lay the axels in, working this way than it is on your back trying to work over your head," Ogle said.

Vending machines dispense supplies

Throughout the plant, Link-Belt incorporates Kaizen processes in its production. Kaizen is a Japanese term refer-

continued on next page

ring to continuous improvement — no doubt an influence of Link-Belt's parent company, Tokyo-based Sumitomo Heavy Industries. Signs of Kaizen abound in the plant, such as in an orange-colored rack that has parts at waist height so that workers can pick them more efficiently.

"A while back, a guy would get a pallet of parts delivered to him. What's he doing? Picking them up? Everything was probably in a hodge podge area," Ogle said.

In 2009, Link-Belt began building its own formed booms. However, until June 2015, the plant didn't have the capability to machine the collars on the booms; so the booms had to be shipped out to have that done and then shipped back. Now the plant has a Burkhart+Weber milling machine to do that work. Elsewhere in the plant is a computer numerical control (CNC) Mitsubishi machining center that has 240 tools and does all the heavy weldments up to 80,000 pounds. The plant also has a second, smaller Mitsubishi machining center.

"We also have welding vending machines, believe it not," Ogle said. Rather than snacks, the vending machines dispense special wires or other supplies. A welder swipes his or her barcoded badge, keys in the job number, and the material gets dropped into that job.

The plant even has its own parts superstore — "some guys call it Walmart," Ogle said. But it's not as super as it used to be when parts were stacked on shelves to the ceiling. The shelves now reach about chest height and contain just enough just-in-time parts to build the next three or four units.

An interesting feature of the production floor parts store is that workers from the parts distribution center who need a part to fix a machine in the field can come over from their building to pick a part but not the other way around.

"The idea is a machine down in the field is a heckuva lot more important than a machine being built here at the factory," Ogle said.

JP Jones shows how easy it is to move a 10-foot fly section in position on Link-Belt's new HTC86110 truck crane.

Mike Ogle leads a tour of the Link-Belt plant in Lexington, Ky.

"The biggest thing I like about it is when you go through the factory, you see all the improvements." *Sheldon Baker, Canadian Crane Rentals Ltd.*

Touch-up specialist Janetta Elwick places sand strips on the deck of a new HTC86110 truck crane in the Link-Belt factory.

Paul Broniewicz and Larry Eckardt of Imperial Crane Services prepare to enjoy the CraneFest charity auction at the Keeneland sales pavilion. The seat behind Eckardt is typically reserved for Bob Baffert, trainer of 2015 Triple Crown winner American Pharoah.

NEW PRODUCTS

Future lube truck revealed

Production of Maintainer's newly designed lube trucks is set to begin in 2017.

Maintainer Corporation of Iowa has introduced what it calls "the Lube Truck of Tomorrow."

The manufacturing company — based in Sheldon, Iowa — offered a sneak peak at the major redesign of its lube truck bodies at the most recent MinExpo International this September in Las Vegas, said a news release from Maintainer.

"Maintainer has been working on ideas for our customers to improve their bottom line, and we think our new lube concept will provide great results," the release quoted Tim Wibben, the company's sales and service manager.

A key component of the redesign is weight reduction, the release noted. It will allow users to maximize their payloads while complying with bridge laws and chassis limits.

"By using lighter, stronger materials in conjunction with more advanced finite element analysis (FEA), we have achieved a more efficient design for our customers," Nathan Schiermeyer, Maintainer's engineering manager, said in the news release.

An eight-sided fuel tank replaces the traditional oval version of existing models. Schiermeyer said the new design reduces weight by 21 percent on a 2,000-gallon tank.

"Plus we realize these trucks can be rolling billboards for our customers, and the flat design will be easier for customers to decal," he said.

The new design also enables operators to access frequently used components more easily with most functions "now available right at the reel box," the release said. "The extended step bumper has been removed and product moved lower to the ground to reduce the need to climb."

Other features include DuaLock aluminum drawer sets and wider access steps to the bed.

Maintainer plans to begin production of the new designs in 2017.

For more information about the company, visit www.maintainer.com.

One last option for power system

The Raptair-MF can now be ordered with just a generator and a rotary screw air compressor.

A new option has been added to the line of six-in-one Raptair-MF modular multifunction diesel-driven power systems from VMAC.

For applications that don't need a welder, the Raptair-MF "can now be ordered with only a generator and a rotary screw air compressor," said a news release from VMAC, which stands for Vehicle Mounted Air Compressors.

"This gives mechanics a truly customizable power solution, in the combination that best suits their needs," the release said.

Powered by a Kubota diesel engine, the Raptair-MF can be skid-mounted for easy movement, the release said. Or it can easily fit on a service body's side pack, "leaving the bed free for cargo and tools."

The unit also allows the truck engine to be turned off while working.

All combinations of the Raptair-MF include a VMAC 45-cubic-feet-per-minute 100 percent duty cycle rotary screw air compressor as well as the following choices: 10.2-kilowatt continuous AC generator; eight kW continuous AC generator, 300-amp DC welder, and 12- to 48-volt battery booster/charger; power takeoff port with optional hydraulic pump; and cold-climate kit.

"Adding the new generator-air compressor option package to our Raptair-MF multifunction system is the last step in true customization for this product," the release quoted Tod Gilbert, VMAC's vice-president of product development.

For more information on VMAC, which is based in Nanaimo, B.C., visit http://vmacair.com.

CALENDAR OF EVENTS

NOVEMBER 2016

Nov. 9-10, 2016
Municipal Equipment Expo Canada
International Centre, Toronto, Ont.
"Experience two action packed days analyzing new products and services; networking with colleagues and competitors; and gaining valuable insight into the latest advancements."
http://www.municipalexpo.ca

Nov. 11-17, 2016
ASME International Mechanical Engineering Congress & Exhibition
Phoenix Convention Center, Phoenix, Ariz.
"The largest interdisciplinary mechanical engineering conference in the world."
https://www.asme.org/events

Nov. 16-18, 2016
Fabtech
Las Vegas Convention Center, Las Vegas, Nevada
"Find the tools to improve productivity, increase profits and discover new solutions to all of your metal forming, fabricating, welding, and finishing needs."
http://www.fabtechexpo.com

Nov. 17-20, 2016
Charlotte International Auto Show
Charlotte Convention Center, Charlotte, N.C.
"Back by popular demand will be our History of the Automobile display."
http://charlotteautoshow.com

Central Florida International Auto Show is at the Orange County Convention Center in Orlando Nov. 24-27. *Photo by Nehrams2020/Wikimedia*

Nov. 24-27, 2016
Central Florida International Auto Show
Orange County Convention Center, Orlando, Fla.
"Check out the pre-production models that are sure to steal the spotlight at this year's show."
http://autoshoworlando.com/

Nov. 25-27, 2016
Motor Trend International Auto Show
Las Vegas Convention Center, Las Vegas, Nevada
"Over 350 of the newest cars, trucks, and SUVS all in one place!"
http://autoshowlv.com

Nov. 30-Dec. 2, 2016
Construct Canada
Metro Toronto Convention Centre, Toronto, Ont.
"Visit 1,600+ exhibits, including 100+ international exhibitors, bringing the latest in design and construction innovation in products, technologies, best practices and applications."
http://nationalgreenbuildingexpo.com

JANUARY 2017

Jan. 4-6, 2017
Dakota Farm Show
USD DakotaDome, Vermillion, S.D.
"Join over 25,000 agricultural producers from South Dakota, Nebraska, Iowa, and Minnesota to review the latest farm technology."
http://dakotafarmshow.com

Jan. 8-22, 2017
North American International Auto Show Detroit
Cobo Center, Detroit, Mich.
"At NAIAS you have the opportunity to see up-close the vehicles and technologies that will shape the future automotive landscape."
http://naias.com

Jan. 8-12, 2017
Transportation Research Board 96th Annual Meeting
Walter E. Washington Convention Center, Washington, D.C.
"The meeting program will cover all transportation modes, with more than 5,000 presentations in nearly 750 sessions and workshops."
http://www.trb.org/AnnualMeeting/AnnualMeeting.aspx

Jan. 12-16, 2017
New England International Auto Show
Boston Convention & Exhibition Center, Boston, Mass.
"The premier showcase of the newest model year imported and domestic vehicles — cars, vans, crossovers, hybrids, light trucks and sport utilities."
http://www.bostonautoshow.com

World of Concrete returns to Las Vegas in January.

Jan. 16-20, 2017
World of Concrete
Las Vegas Convention Center, Las Vegas, Nevada
"Featuring innovative products, construction machinery, construction equipment, safety training courses, new technologies and unlimited networking opportunities."
https://worldofconcrete.com

Jan. 26-29, 2017
National Automobile Dealers Association Convention & Expo
Ernest N. Morial Convention Center, New Orleans, La.
"Come celebrate NADA's 100th anniversary and expand your brand's recognition at the industry's largest marketplace of products and technologies."
http://convention.nada.org

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