IDC Industrial Review

The skilled labor SHORTFALL

Pullers pull their weight

How productive are your maintenance workers?

FALL | WINTER 2013

IDC-USA®

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FALL | WINTER 2013 | VOLUME 7 NO. 2

FEATURES

DEPARTMENTS

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Information is power

Information is power, were the words of wisdom that Gordon Gekko gave the young Bud Fox in the 1987 blockbuster movie, Wall Street. And while I don't agree with all of Gordon's advice in the movie (or the example he set), he was certainly right about the power of information. Whether you're talking about business, power transmission or plant maintenance . . . information is power.

It is that power of information that becomes very valuable when we are trying to avoid line failures, develop new drive systems or improve efficiencies. I can think of nothing that feeds that power of information more than education. When IDC-USA started IDC University 13 years ago, there were two motivations. First, we felt there was a void in the industry for quality, hands-on training. Granted, chain manufacturers provided chain classes and bearing manufacturers provided bearings classes (with some sales pitches along the way), but there weren't many places to get good hands-on training that taught you how everything worked together. Secondly, we felt an obligation to give back to such a great industry.

Accordingly, IDC University was started in 2000, and available to anyone in the industry. It continues that tradition today. Our students come from distribution, manufacturing and plant maintenance. Our classes consist of almost a week of training, quizzing, homework and testing to give the student a valuable understanding of how power transmission works. Our goal isn't to produce engineers. Our goal is to have graduating students that have enough information to know what questions to ask and where to find the answers, regardless of the application.

Today, IDC University offers courses such as: Power Transmission Principles, Bearings A-zZ, Bulk Material Handling, Hydraulic Principles and Applications, and Motors and Controls. All of these courses are second to none, and they are open to anyone in the industry. For further information, you can go to our website, www.IDCuniversity.com, or talk with your local IDC Distributor.

JACK L. BAILEY

This issue of IDC Industrial Review addresses education in the forms of training and apprenticeships. Whether you receive educational information from IDC University courses, other training venues, or in on-the-job apprenticeships, the goal should be to attain as much information as possible that will make you better at what you do.

Sometimes when I hear excuses for failure to educate employees, I have to smile. There is no excuse. The frequent alibi is the fear of investing education dollars in an employee only to have them no longer work at the company. When I hear this, I'm reminded of the old adage, "The only thing worse than educating an employee and having them leave, is not educating them and having them stay!"

In short, I would strongly urge you to take us up on our offering at IDC University. It's extremely valuable, will add money to your bottom line, and it's a bit more legal than Gordon Gekko's approach!

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IDC-USA®

KT Pro Tools develops new tools exclusively for IDC-USA

KT Pro Tools, maker of the popular King Tony America brand hand tools, has designed, engineered and manufactured a unique Bearing Locknut Socket at the request of IDC-USA. The new Bearing Locknut Sockets, available exclusively through IDC Distributors, are higher quality than any others in the market and are available at a more affordable price. They are impact quality and made from chrome molybdenum alloy, exceeding ANSI and DIN standards. Plus, they come with a lifetime warranty. The KT Pro Tools Bearing Locknut Sockets were developed with the plant in mind. The new design eliminates the need for a spanner wrench or chisel in tight spaces when trying to carefully remove a bearing locknut. They feature large, easy-to-read markings, sockets sized for locknuts N01-N13, drive end, sized for standard ratchets, t-handles, or torque wrenches 3/8", 1/2" and 3/4", and make tightening or removing a bearing locknut much easier. Learn more by contacting your local IDC Distributor or visit www.IDC-USA.com.

IDC University

Visit www.IDCuniversity.com to register online.

HYDRAULIC PRINCIPLES
Oct. 21-24, 2013

BULK MATERIAL HANDLING
Nov. 18-21, 2013

MOTORS & CONTROLS
Dec. 9-12, 2013

BEARING TRAINING: A-zZ
March 10-13, 2014

BULK MATERIAL HANDLING
Nov. 17-20, 2014

HYDRAULIC PRINCIPLES
Sept. 15-18, 2014

MOTORS & CONTROLS
Dec. 8-11, 2014

POWER TRANSMISSION PRINCIPLES
Feb. 10-13 and Aug. 18-20, 2014

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OFFERS A COMPLETE LINE OF QUALITY PRODUCTS

If you're looking to control bearing and power transmission costs, **IDC Select** offers a complete line of quality products. Manufactured in ISO certified facilities, **IDC Select** products exceed the quality, performance, appearance and packaging standards expected in today's industrial marketplace. Independent lab tests ensure every **IDC Select** product has the quality to meet the high-performance demands of today's industrial applications. **IDC Select** products are exclusively available from IDC Suppliers who maintain inventory stock levels at their respective local facilities. A larger inventory is maintained at their IDC-USA distribution center in Indianapolis.

IDC-USA®

IDC University changes made

Changes have been made to IDC University's most popular class, Power Transmission Principles (PTP). "IDC University is known for its balance of hands-on and classroom style learning. We are continually improving our courses to make them more interactive," explains Almeda Myers of IDC-USA.

For the first time ever this past August, students utilized new hands-on training stations to design drives that powered a belt conveyor donated by JD Schwarz of Chicago Chain & Transmission (pictured above right).

A special thank you to the IDC Preferred Suppliers who donated product for the training stations:

- Cleveland Gear
- IDC Select
- Moline Bearing Company
- North American Electric
- Linn Gear
- Renold Jeffrey
- Toshiba
- KT Pro Tools

This was the last PTP session in 2013. If you are interested in learning the basics of PTP and how to design a workable drive, please contact Almeda Myers at amyers@IDC-USA.com to reserve your seat in the next PTP class.

Hydraulic principles & applications

The Hydraulic Principles & Applications class has moved from Sept. 16-19 to Oct. 21-24. This is your chance to obtain hands-on and classroom training on the principles, functions and applications of low-pressure/low-force and high-pressure/high-force hydraulics. Upon completion of this course you will be able to identify the basics of pumps, cylinders, valves, motors and related systems; and how to identify applications in the field. Sign up today for this course or any of the other IDC University courses available throughout the year. For more information visit www.IDCuniversity.com or contact Almeda Myers amyers@IDC-USA.com, 317-829-0109.

New products from your local IDC Distributors

IDC Distributors have added several new programs to their line cards this year. With the addition of Toshiba Motors, Hanna Cylinders, Maudlin Shims, IDC Select Conveyor Idlers, IDC Select Insta-Belt and the expansion of the Jason Industrial line to include Thermoplastic hose, IDC Distributors now offer you more options.

Maudlin & Son Manufacturing

Maudlin & Son Manufacturing recently joined the IDC family. The Houston-based company is family-owned and has served the Houston area since 1938. The company offers a complete line of Stainless Steel Slotted Shims; Plastic Slotted Shims; Key Stock; Feeler Gage; Coil Shim Stock in stainless, brass and steel; Plastic Shim Stock; Flat Sheets; and a new Stainless Steel Foil Wrap.

- 24-hour turnaround on all stocked shims
- Tightest tolerances in the industry
- Flattest shims in the industry which eliminates soft foot problems
- Exclusive adjustable shim organizer with every kit to protect your investment and simplify your tool-room environment
- Custom packaging upon request

Hanna Cylinders

Founded in 1901, Hanna Cylinders is a leading designer, manufacturer and marketer of premium quality, industrial grade tie-rod and custom engineered cylinders. It is a complete source for virtually any heavy duty pneumatic or hydraulic cylinder requirement. Specializing in custom designed and built cylinders, whether one piece or 50,000 cylinders per year, Hanna Cylinders are now available through your IDC Distributor.

- All cylinders and components are 100% tested
- Highly customizable product
- Cylinder designs from 1.00" - 40.00" bore and 450.00"+ stroke
- Operating pressure up to 10,000 psi
- Special design material, coatings and seals for harsh environments
- Technical support available to you
- Cylinder refurbishment/repair programs

IDC Select Insta-Belt

If you find yourself with a broken or worn conventional rubber V-belt, IDC Select Insta-Belt is the ideal rescue belt or permanent solution. Now available in the IDC Select product line, these adjustable V-belts stand up to the toughest conditions. Ask your IDC Distributor about it today!

- Replaces 3L, 4L/A, 5L/B and C profile belts
- Easy snap-and-twist assembly (no special tools required)
- Perfect for emergency rescue repairs or preventative maintenance
- Performs well in extreme environments
- Resistant to solvents, water and chemicals as well as extreme temperatures: -40° F to 240° F
- Ideal for difficult-to-align drives
- Increased strength, durability and longer life than a conventional V-belt

IDC Select Conveyor Idlers

IDC Select now offers conveyor idlers that will save you money. With these conveyor idlers you can use fewer to set your conveyor by spacing them out further than other conveyor idlers and you get longer life and greater load rating. Ask your IDC Distributor to learn more today!

- Rolled ends eliminate welding for better bearing alignment

- Sealed ball bearings allow for a greater load rating
- Polyamide end case protects the bearing from vibration and shock
- Larger shaft increases bending and torsion service factor
- Install at 5' spacing and reduce your overall costs by over 25%

Toshiba

IDC Distributors have added Toshiba low- and medium-voltage industrial electric motors and drives to their product offering. Toshiba is a leading manufacturer of low- and medium-voltage adjustable speed drives ranging from 1/2 to 10,000 HP and 230 to 6,600 V.

- High torque – uses reduced voltage and handles brownout and power dips better
- Superior insulation – longer life, better moisture resistance and holds windings in place; three extended warranties on motor packages with VFD insulation
- Balance exceeds NEMA standards – less vibration, smoother operation, bearings run cooler – and improved efficiencies as air gaps are maintained
- Extremely low temperature rise – 2x longer life for every 10 degrees below capability

- Bigger bearings – higher load/overload capabilities, same size on both ends which evens the load, and runs cooler
- Multiple leads – multiple options for starting
- Large inventory
- Cast iron construction – rigid, moisture and corrosion resistant and better bearing alignment

Jason Industrial

Seventeen new hoses that cover applications in the petroleum, material, handling, water and food markets are now available through your IDC Distributor.

- Banding coils and sleeves allow for better coupling securing surface on the hose outside diameter; banding sleeves are color-coded to match specific hose types.
- Many hoses have "go-glide" external clockwise helix which makes hoses easy to drag
- Lighter and more flexible hose are preferred by most tank truck drivers
- Many hoses have a cold weather resistance down to -40°F
- Food hoses meet FDA and USDA requirements
- Your product offering includes a crimp version (Type C) of the Vapor Recovery fittings

All petroleum hoses have Safety Ohm (SΩ) static wire in the cover of the hose which makes it easier to pull out and use as a ground wire.

IDC Charitable trust supports Oklahoma tornado relief effort

After an F-5 tornado ripped through Oklahoma in May, many were left picking up the pieces to rebuild their homes and their lives. The IDC Charitable Trust Corporation donated $5,000 to the relief fund to provide food, water, temporary shelter and medical care or fund long-term rebuilding efforts.

"When this type of disaster strikes, it impacts all of us. It is not just a local community event. The reach includes the businesses that work with the companies involved, the families with long-distant connections and the many volunteers and contributors who assist with the relief effort. The rebuilding process takes the help of many which is why the IDC Charitable Trust Corporation was compelled to support the relief efforts in Moore, Okla. Our hearts go out to this community," said Jack Bailey, president and CEO of IDC-USA.

The IDC Charitable Trust Corporation is a 501(c)3 organization founded and supported by IDC-USA. The mission of the IDC Charitable Trust Corporation is to provide support and contributions for education and charitable causes.

THE skilled labor SHORTFA

Apprenticeship and training programs critical to the future of manufacturing

Training is extremely important to the future of manufacturing in the United States, yet in many states it has fallen by the wayside. Training for skilled manufacturing positions has been hit by a perfect storm of budget cuts and the mistaken idea that

PHOTO: FUSE

all young workers should go to college. What training exists has a near-exclusive focus on non-manufacturing skills. Well-paid manufacturing jobs requiring manual skills are out there, and as the skilled workforce ages, it is becoming more and more difficult to fill critical positions with trained employees.

At Connecticut Spring & Stamping, the situation had become so desperate that to meet its capacity and continue to grow, the company has had to replace formerly state-funded training with its own programs, tailored to the skill sets required for tool and die makers and various spring coiler setup operations.

While a successful in-house program definitely has rewards and helps CSS attract and retain skilled employees, the company still maintains that states should go back to providing these educational services, so companies can focus on what they do best – hiring and manufacturing.

Rapid growth fuels hiring

Farmington, Conn.-based CSS is growing at a fairly rapid pace – about 20-30 percent per year, year over year. The company has been struggling for the past decade to get the qualified workers it needs to meet its capacity and expand its capabilities. For the 40 years before that, manufacturing facilities like CSS could rely on state-supported manufacturing sciences programs at local colleges and technical schools to train technical workers, including tool and die makers and spring coilers. But no more.

"As the manufacturing companies and jobs migrated to the South or overseas, the state began losing interest, and stopped funding these programs," said Steve Dicke, vice president of sales and marketing at CSS. "We would run an ad for a spring set up person, and would rarely get any applicants with the proper training." Dicke explains that he found many likely candidates were pursuing computer programming training. Although the manufacturing jobs at his shop do require computer literacy to program machines, they also require an additional set of manual skills – the ability to maneuver the parts and machines.

According to Dicke, the difficulty in finding skilled employees could slow long-term growth and future capacity needs, and means that CSS has to rely on overtime in the short term. "Managers are working longer hours and are leaning harder on key employees to support customer needs. In addition, we have to look at new opportunities more carefully and do not take on an opportunity unless we know we can fully support it."

State apprenticeship programs fall by the wayside

CSS director of human resources Kathy Bellemare explains that to become a certified skilled worker in Connecticut, individuals must complete apprenticeships comprised of 6,000-8,000 hours of on-the-job training (depending upon the specific job) and 432-600 hours of related training in a school-based setting. The company must be registered with the state apprenticeship program for the worker to participate.

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The apprenticeship program is based on completion of a set of work standards, including orientation, lathe, milling (horizontal and vertical) machine operations, grinding operations, sawing and cut off operations, drill machine operations, metal processing, bench assembly, trade specialty, and the related training at a technical school facility.

In the past, apprentices got this related training at trade schools, for example the nearby EC Goodwin Technical School, attending about four hours per week during working hours as part of the required program. Each apprentice was graded on their knowledge and placed in a program dependent upon their skill level. They would be given credit towards the related training hours for skills they already had.

Today, the OJT and related training requirements remain the same, but the technical schools no longer offer appropriate manufacturing schooling alternatives. Rather than being placed in programs to match their skill level and given credit for skills they have, apprentices are forced to take full semester courses during the evening. For example, CSS has two apprentices who are close to completing the state apprenticeship process and have been very frustrated with the 500 hour schooling component, which has become a barrier to certification. They have nowhere to go to take the specific classes they need. Instead they have to take time off from work and take a group of courses, not all of which are relevant.

At CSS, efficiency drops by 20 to 30 percent when a skilled employee trains an apprentice

"The apprentices we have on the state program are really having difficulty getting the class time they need while working full time," says Bob Allen, director of engineering, tooling and metal form. "The programs seem to be more focused on college aptitudes than manufacturing skills."

He adds that CSS has approached vocational high schools to see if they were interested in running courses and found their emphasis to be firmly on the side of training nurses, electricians and carpenters. "They have told us that there are not enough people for them to offer these courses, but we know that the jobs are there. With an aging workforce we need the next generation of skilled manufacturing employees to keep us ready and staffed for whatever the future holds for CSS."

Apprenticeship program bridges the gap

Because of the limited training resources, CSS made the decision in 2012 to create its own in-house apprenticeship program, tailored to spring and stamping to produce metal formed parts and coiled springs. Specific tracks were developed for CNC production set-up, press and fourslide diemakers, stamping press set-up operator, fourslide set-up operator and heat set set-up operator. The CSS apprenticeship program is only offered to current CSS employees as an opportunity for advancement. It requires only a high school diploma or GED.

Under the direction of a qualified training instructor and using the same guidelines established by the state apprenticeship program, apprentices are trained in tasks assigned to each competency (basic, intermediate and advanced) for each position.

According to Kathy Bellemare, the structured and formal program gives the apprentices a defined career path. After successfully completing each competency, the apprentice receives an increase in compensation. There is no timeline associated with each competency, and each apprentice learns at his or her own pace. "We have our own certificates and clear manager-defined functions, techniques and skills for each position, with which apprentices must be proficient."

The expectation is that workers will complete the program and get to competency level in about 3,000 hours. Required training is handled by crediting apprentices for what

they already know, identifying any weaknesses, and providing the related training in an extremely focused way. "When a skilled employee works with an apprentice and the person is having a problem with blueprint reading or shop math, we send them to a class, or even bring the training in house," said Bellemare.

A diverse group of 11 people are currently enrolled in the program, including five minorities and two women. Trainees are basically working through the program eight hours a day, five days a week. As they become more advanced in the trade, CSS will promote more employees into the program.

Since the program began less than a year ago, there are no graduates yet, but the first crop is well on its way. For example, 23 year old tool maker Alex Pabon has been working at CSS for five years and credits the program for opening doors to him that would not have been otherwise. "It has helped me understand better how things are made and how important it is to make it right the first time." He adds, "The trainers are easy to talk to and if you have any questions they go out of their way to make sure you understand. They are taking me under their wing and making sure I get the training needed to become a good tool maker."

Brian Mills, a 24 year old auto power press set up apprentice, says the program has given him a goal he can shoot for every day and makes the job a lot more interesting. "When I first started here as an operator and watched the setup people at work, it looked hard and very confusing, so when I heard about the apprenticeship program I was a little nervous and skeptical about joining. But once I did, it was a smooth ride and not as hard as I thought. Once I'm done, I want to keep moving forward and make a good career for myself. I would not have had the opportunity if it wasn't for the apprenticeship program at CSS."

According to CSS, the cost of the program is fairly low, but they are definitely losing some efficiency. They estimate that there is about a 20-30 percent weekly efficiency loss associated with having the skilled employee training the apprentice.

To fund the program, CSS has taken full advantage of available grants, including the Connecticut Department of Labor's 21st Century Skills Training Program and the Advance Training Grant Program.

Is there a future out there for manufacturing training?

While the CSS program is clearly a success, the company still would prefer to focus solely on manufacturing. They created the program to fill a void, and it means they will be able to promote from within their own ranks, but CSS would prefer not to take the place of educational institutions. They note a glimmer of hope on the horizon, as a few technical institutions and local community colleges have recently been putting out feelers concerning potential training programs and internships, possibly in response to requests from other manufacturers.

MANUFACTURER PROFILE

P.T. International

The leading supplier for metric (and American standard) industrial power transmission products

BY CLAIR DAVID URBAIN

The International System of Units (SI), commonly known as the metric system, is the international standard for measurement. More than 95 percent of the world's population lives in countries that primarily or exclusively use the metric system.

Since 1970, the United States, Liberia and Burma are the only nations in the world that don't use the metric system. A number of countries, including Japan and South Korea, prohibit the importation of products with any non-metric indications on their labels, and more countries are sure to follow, reports Darin Davenport, vice president of marketing and business development at P.T. International, a Charlotte, North Carolina-based supplier of industrial power transmission components and mounted ball and roller bearings.

SPLIT PILLOW BLOCKS AND SPECIALTY HOUSINGS
Solid base housing design stocked in three different materials: Cast Iron – SAF, Ductile Iron – SAFD and Cast Steel – SAFS

While the rest of the world is standardized on metric equipment and specifications, the United States continues to rely on American standard specifications in most of its industries and products.

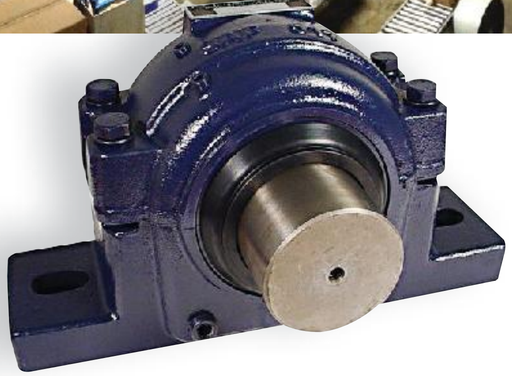
"That creates a disconnect with the rest of the world and puts U.S. manufacturers at a disadvantage if they run equipment produced in other countries or want to supply components and products to customers outside of the United States," Davenport says.

DAVENPORT

That disadvantage is P.T. International's key point of difference. It's one of the leading suppliers of metric power transmission components in the United States and also carries an extensive line of American standard dimension products.

"Ask nearly any IDC distributor what they think about first when they hear P.T. International, and it is metric power transmission components," says Davenport. "We are considered the go-to guys for metric dimension power transmission components, but we also stock an extensive line of American standard dimension components."

PHOTOS: P.T. INTERNATIONAL



The LER-DC Dust Cover/Wiper Seal can be used with PER or LER seals to provide optimum protection against contamination in harsh environments.

Early on, the privately held company identified the need for metric replacement power transmission parts and production components. That was nearly 20 years ago, and its focus has created a specific and profitable niche for itself.

"We have many customers whose parent company is in Europe or another country that requires them to use metric replacement parts or components in their manufacturing processes. Logistically, it's time-consuming and expensive to order replacement parts through the home office and have them delivered to the plant in the United States. When they find out that we can supply them with the components they need, often overnight or even same day and at a reasonable price through their IDC Distributor, they love it," Davenport says.

30,000 SKUs

P.T. International stocks more than 30,000 SKUs in its 80,000 sq.-ft. warehouse, including a wide variety of mounted bearings ranging from 10mm to 22" shaft diameter. "We track our order fill rates and more than 95 percent of the orders are filled from our existing warehouse stock. If we don't have it, we will help distributors we serve to locate it. We can even offer same-day delivery if the customer needs it," Davenport says.

It takes more than a well-stocked warehouse to meet customer needs for power transmission components; P.T. International also has 30 sales representatives across the country that assist power transmission distributors with orders. "We also have a top-notch customer service department as well as a staff of engineers in Charlotte who have extensive power transmission component experience. We design all of our components in Charlotte and work with manufacturers in 10 different countries in Asia, Europe and South America to produce them. As the popularity

CONTINUED ON PAGE 20

P.T. International's warehouse in Charlotte, North Carolina, specializes in metric components but also stocks a substantial number of American standard products. It fills 95 percent of its orders from its inventory and regularly helps distributors find hard-to-locate items for customers

P.T. International's long list of power transmission components

The Charlotte, N.C.-based power transmission manufacturer stocks more than 30,000 SKUs of metric and American standard dimension components and has an in-stock fill rate greater than 95 percent.

Major Product Line:	Inch	Metric
Mounted ball bearings	X	X
Mounted roller bearings	X	X
Bearing adapters and accessories	X	X
Roller chain	X	X
Sprockets		X
V-belt Sheaves		X
Spur gears and racks		X
Rod ends		X
Keyless locking hubs		X
Tapered bushings		X
Timing pulleys		X
Winkel combined bearings and profiles for linear motion		X
Eich spring wound bearings	X	X
Roll-ring chain tensioners	X	X
HRC Series jaw couplings	X	X

P.T. International stocks a wide variety of power transmission components in metric sizes.

for metric components grows, we might be able to produce the components here, but right now, using contract manufacturers around the world is the most effective way to match supply with demand," Davenport says.

Trend to metric components

Davenport says P.T. International predicts more metric components will be required on production equipment and in products manufactured and sold within the United States.

"If a plant in the United States uses the same metric components as its sister plant in Mexico or elsewhere in the world, it is easier to design and support those plants," he says.

Tom Haffner, president and co-founder of P.T. International, says adopting metric dimensions is a key part in becoming a world-class manufacturer. "If we're going to compete as a country, we must have designs that are in metric so they will be acceptable and appreciated worldwide," he says. "We make good products here, but the world doesn't want them because they're not metric. We're slowly recognizing this and companies are realizing that we have to switch over."

Haffner estimates that metric dimension components make up

HAFFNER

less than 10 percent of all U.S. manufacturing, but that is slowly changing. “American manufacturing companies are gradually beginning to see that the equipment they design will have to move beyond the legacy American standards, particularly if they want to expand globally. Many American equipment manufacturers are forced to incur the added expense of maintaining dual product lines—inch-based for the U.S. market and metric for export,” he says.

The automotive industry was one of the first industries to make a complete move to metric dimensions. Over the past 20 years, all American automotive manufacturing has gone fully metric. In addition to the cars themselves, automotive assembly machinery that often comes from Europe, Taiwan, China, India or Brazil, is metric.

“Some of the companies that make these machines are located in or around Detroit, but many of them are Swiss, Italian or Japanese. The design comes out of its worldwide engineering facility, then one set of drawings is used here and in Europe to build the same machines. A piece of equipment could easily be moved out of Detroit and put in a plant in Sao Paulo, Brazil, or Mexico City, Mexico,” Haffner says.

Like the automotive industry, the food processing industry is quickly moving toward all-metric dimensions on production equipment.

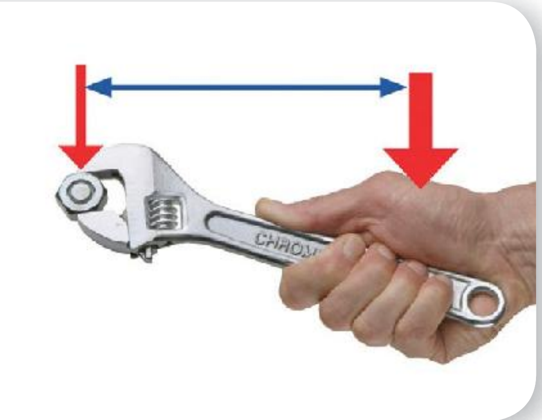
Haffner cites one local customer as a shining example. “This customer builds machines that are exported to many corners of the globe. They have other divisions in Germany, India, Brazil and China. Each of these five manufacturing sites builds machines for the entire globe, minimizing duplicate production lines. That’s the globalization that we are finally seeing, and that’s why metric will win out in the long run.”

Wait a moment!

Don't forget to consider moment loads when specifying thin section or slewing ring bearings

BY SCOTT SHUPP

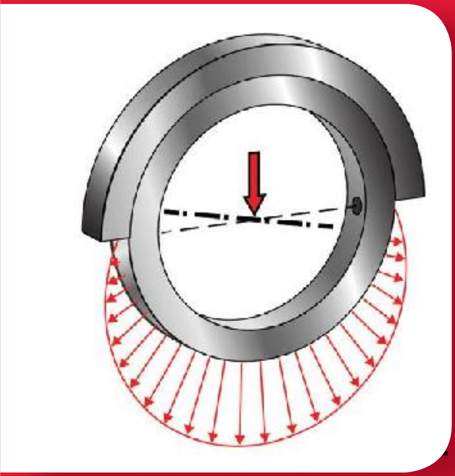
What is a moment load? A moment load is a tilting load that attempts to tilt the rings of a bearing perpendicular to the designed rotational axis. The diagram below shows this type of loading compared to radial and axial (or thrust) bearing loads.



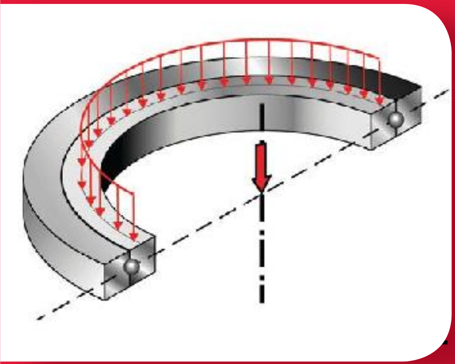
To further explain, a moment load may also be thought of as a "torque." A "moment," or "torque," is a force (or load) acting at a specified distance from a specified point. For example, when you tighten a bolt using a wrench, the resulting "moment" is the product of the amount of actual force you exert on the wrench multiplied by the distance from the center of the bolt to the position of your hand on the wrench. In the case of a bearing, a moment load is a multiple of the distance from the center of the bearing raceway to the applied load, and that load acting on the arm.

Most designers are familiar with bearing applications having multiple bearings (two or more) that work together to accommodate the loading in the system. The resulting bearing loads in these cases are typically analyzed as radial or thrust loads when evaluating the bearing system. However, by only having a single bearing, any radial load in a system acting anywhere other than at the center of the bearing ball path will generate a moment load. SilverThin offers bearings from stock that are specifically designed for applications with significant moment loads, where there are space, weight and cost saving benefits of using a single bearing. These are unique and specially designed single row, thin-section ball bearings where

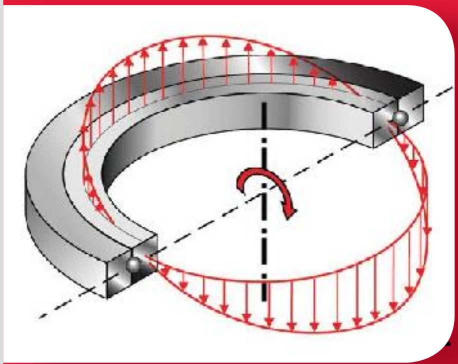
RADIAL LOAD

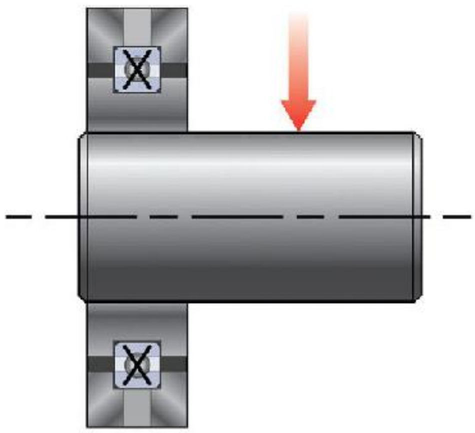


AXIAL LOAD



MOMENT LOAD





the internal geometry of the race is reminiscent of a gothic arch, also known as an "X-Type" or "4-Point" design. For these bearings there are actually four points of contact between the balls and the raceway in a single bearing.

When only one bearing is in a system, as is also the case in many Slewing Ring bearing applications, any load can generate significant moment load. Large moment loads often occur when an apparatus extends from a platform with a slewing ring or thin section bearing at its base. A simple example might be a robotic arm extending a few feet from a stationary base to pick a heavy object and turn it. The Thin-Section or Slewing Ring bearing at the base of the arm connecting it to the platform experiences a moment load.

When a bearing is constantly or intermittently loaded, it should be engineered to handle the life requirements of the application. It is important to identify as much of the potential loading that a bearing system could face at the design stage in order to assure the complete system will meet its users' service requirements. If you have a Thin Section or Slewing Ring bearing application, contact your local IDC Distributor or SilverThin Engineering for help in finding the best solution.

SilverThin offers a wide range of X-Type bearings designed to accommodate moment loading in a variety of applications. Many sizes are available from SilverThin stock through an IDC Distributor.

CONTINUED ON PAGE 24

PHOTOS: SILVERTHIN

What is a thin section bearing?

Thin section bearings are a family of bearings designed from a limited number of widths and thicknesses (cross sections), with each cross section manufactured in a wide range of bore diameters. Most radial ball bearings are designed so that as the bore size increases, the width and the thickness of the bearing change proportionately.

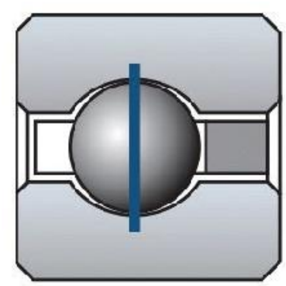
In the case of thin section bearings, the cross section remains the same as the bore diameter increases. The thin section bearing family is made up of 12 primary cross section sets ranging from 3/16" to 1" and with bore sizes ranging from 1" to over 40". The combination of a large bore diameter in proportion to the small cross section makes these parts appear "thin" in comparison to standard ball bearings.

Thin section bearings are made from 52100 chrome steel and 440C stainless steel. They can also be coated with platings like thin dense chrome. Some sizes can be configured with seals or shields. Thin section bearings are also made in one of three different contact styles: radial contact, angular contact, and four point contact. These options, along with several ball and retainer types make for a diverse range of parts even among the limited cross sections of the thin section bearing family.

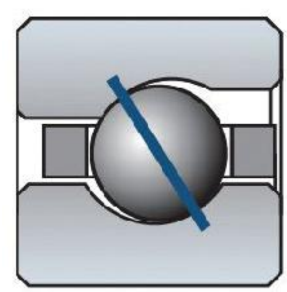
Radial Contact (C-Type) conventional bearing design has a single row of balls which allows for Conrad-type assembly. The C-Type is most commonly used among the three thin section types. Although the radial type is used primarily in applications with radial loads, it can withstand moderate axial and reversing loads as well as moment loads.

Angular Contact (A-Type) bearings feature a reduced shoulder on one side of the inner or outer race ball path.

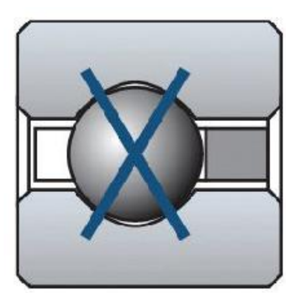
RADIAL



ANGULAR



FOUR-POINT



These bearings accept radial loads and single direction thrust loads. The A-Type requires an application of thrust to establish the appropriate race and ball contact angle. These bearings are commonly used in pairs for applications requiring axial loads in one direction or for reversing axial loads. They provide the appropriate stability, load capacity and repeatability needed in applications requiring higher speeds than the C-Type.

Four-Point Contact (X-Type) bearings are used where a high level of rigidity is required. This bearing can accept radial and thrust loads in either direction. They are also extremely effective with high moment loads. X-Type bearings are designed with gothic raceways creating four contact points between each ball and the raceway. Preloading will provide for additional precision and rigidity of movement. X-Type bearings may replace two thin section bearings in many applications.

Reduces cost

Thin section bearings help reduce total cost in a system by allowing for design efficiency over standard bearing sizes. Because thin section bearings have cross sections that don't change as bore sizes increase, there needs to be no change in the space requirements, and little change in the weight of the bearing, even as the diameter of an application increases. Especially in the case of medical equipment, airborne optical and infrared scanning equipment and robotics, the space and weight requirements of a system are major factors in the overall design and manufacturing cost. In many cases, the price of a thin section bearing is higher than a standard bearing with a similar bore size, but application and design savings due to reduced space and lower weight decrease the total cost in the application.

Scott Shupp is national director of sales for Silverthin Bearing. He can be reached at scott.shupp@silverthin.com.

Avoid creating a culture of EXILE

5 warning signs your employees may lack a vital sense of belonging

BY CHRISTINE COMAFORD

Consider the power of belonging. Adolescents will change their speech, dress and behavior to "fit in" with their peer groups. Inner city teens will commit crimes—including murder—for the privilege of wearing gang colors. Adults, too, gain much of their identity from the neighborhoods they live in, the churches they attend, the political parties they align with. Yes, belonging to "the tribe" is a human need we never grow out of—yet most leaders neglect it in the workplace.

Many companies have fostered cultures of exile. I write about this concept in my New York Times best seller *SmartTribes: How Teams Become Brilliant Together* (Portfolio/Penguin, June 2013, ISBN: 978-1-5918464-8-2, $26.95, www.SmartTribesBook.com). No one is purposely making people feel they don't belong, but they're also not proactively making them feel they do—and that's a huge mistake.

Belonging, along with safety and mattering, is a basic human drive. After food-water-shelter needs have been met, we must feel that we're safe, that we matter, and that we belong. If not, we can't seek self-actualization or, as I call it, "being in our Smart State"—meaning we can't perform, innovate, collaborate, or do any of the other things it takes to survive in our global economy.

This is Maslow 101. Exile is a deep-rooted, very primal fear. The way our critter brain sees it is: "If I'm not part of the tribe, then I must not matter and I'm surely not safe. A lion is going to eat me. My only goal right now is survival so I am going to do and say whatever will keep me safe."

When employees feel this way, they hide out, procrastinate, or say what the boss wants to hear instead of what she needs to hear. Such behaviors are devastating for business. When they occur chronically, not only will your company be unable to move forward and grow, it may flounder and fail.

My business—teaching leaders neuroscience tactics that get teams unstuck, out of their "Critter State" and into their "Smart State"—is booming. I regularly see clients who master these techniques and quickly see their revenues and profits increase by up to 200 percent.

People will never speak up and say they feel they don't belong. It's too scary. It's up to you as the leader to diagnose the problem and take steps to fix it.

Here are several red flags that indicate you may be fostering a culture of exile:

Certain people get preferential treatment. Maybe there are

PHOTO: MATTJEACOCK

different sets of rules for different employees: "exempt" people and "non-exempt" people. (Many companies harbor "Untouchables"—people who were hired and most likely over-promoted because they are related to (or friends with) someone in power.) Or maybe the CEO always plays golf with Drew and Tom, but not Greg and Alan.

Preferential treatment is a leadership behavior and it's extremely damaging. It's a major culprit in making people feel exiled. I counsel companies that have this problem to include it in their Leadership Code of Conduct and insist that all leaders adhere to it.

Cliques and inside jokes flourish. Sure, we all "click" with certain people more readily than we do with others. That's only natural. But if you notice some employees seem to be regularly excluding others—maybe members of a certain department socialize after work but one or two people are not invited—take it seriously. Those who are left out know it, and it doesn't feel good.

It's amazing how little difference there can be between high school dynamics and workplace dynamics. And while leaders can't (and shouldn't) interfere with friendships between employees, they can set an example of inclusion. They can have frank discussions on the hurtfulness of making someone feel exiled. They can hold fun workplace events and celebrations to strengthen bonds between all coworkers.

The point is, it's worth making an effort to help everyone feel they belong. Generally, leaders do set the tone, so when you focus on belonging, everyone will.

There are obvious and visible signs of hierarchy. At some companies there's a stark division—maybe even a chasm—between, say, the executive suite and the hourly workers. The white-collar guys are on a higher floor with nicer furniture, while the blue-collar guys are lucky if the bathroom is maintained. To many people this may seem like the natural order of things—but this attitude is precisely the problem.

Is it really a good idea for the physical workplace to say, "We're in the gated community while you're in the trailer park?" Leaders may not think of it that way, but those under them do. In my work I see tension between white-collar workers and union workers—a pervasive attitude

CONTINUED ON PAGE 28

THE 5 WARNING SIGNS:

- Some people get preferential treatment
- Cliques and inside jokes flourish
- There are obvious signs of hierarchy
- Entrenched silos lead to information withholding
- There is no path for advancement

that because the union guys don't have the same level of education they can't be part of the tribe.

I have noticed that when a company launches innovation initiatives with clients, it's the union employees on the manufacturing line who often have the best ideas for streamlining production and boosting quality. It's just that no one has ever looped them in on initiatives before—and therefore they don't feel like part of the tribe!

What belonging really means is everyone is equal and marching forward together. We need to do all we can to work toward this goal, and getting rid of some of the symbols of divisiveness would be a good start.

Entrenched silos lead to information withholding and turf wars. Of course, departments are, by definition, different from each other. Still, they needn't be alienated from each other. It's possible for departments to be "different" in a healthy way—IT is a band of cool pirates, while salespeople are wild and crazy cowboys and cowgirls out there on the range—while still marching forward together.

It's OK for groups to have their own identity, yet they must still be able to link arms and help each other toward that end goal. That's the beauty of helping get people out of their Critter State—when they have that reassuring sense that they belong to the company overall, they don't have to close ranks and play power games. They can share and collaborate because now it's safe to do so—we're all in this together.

There is no path for personal development or advancement. True belonging is knowing you're not just a cog in the machine. It's knowing employers care about your future and want you to live up to your potential. It's knowing, "I might just be a stock clerk right now but I could be a division manager one day—and the company is willing to help me get there." That's why I encourage clients to implement Individual Development Plans for every employee at every level.

When people see their IDP, they think, "OK, the company's purpose is this, my part is this, and we're all going into this glorious future together." It tells them, "You're safe here; we're planning on you being here for a long time. You belong. We bothered to lay out this plan just for you, and you clearly know what you need to do to grow here. You're part of the tribe, and we're putting energy into figuring out how you can be part of the tribe in a bigger way."

Making employees feel that strong sense of belonging can send performance into hyperdrive.

When people feel they truly belong, they will open up their minds and do everything in their power to make sure the tribe is successful. They'll come to work jazzed and engaged and 100 percent on.

You absolutely cannot inspire this kind of presence, this deep involvement, in employees with coercion or bribery or even logic. It happens on a primal, subterranean level, and when it does, the transformation is amazing to witness.


COMAFORD

Christine Comaford is author of the book SmartTribes: How Teams Become Brilliant Together *(Portfolio/Penguin, June 2013, ISBN: 978-1-5918464-8-2, $26.95, www.SmartTribesBook.com), available at bookstores nationwide and from all major online booksellers.*


It's not about the products
on our shelves.
It's what we do
with our products
that makes the
difference.

Write it down!

Effective written plans help achieve safety compliance

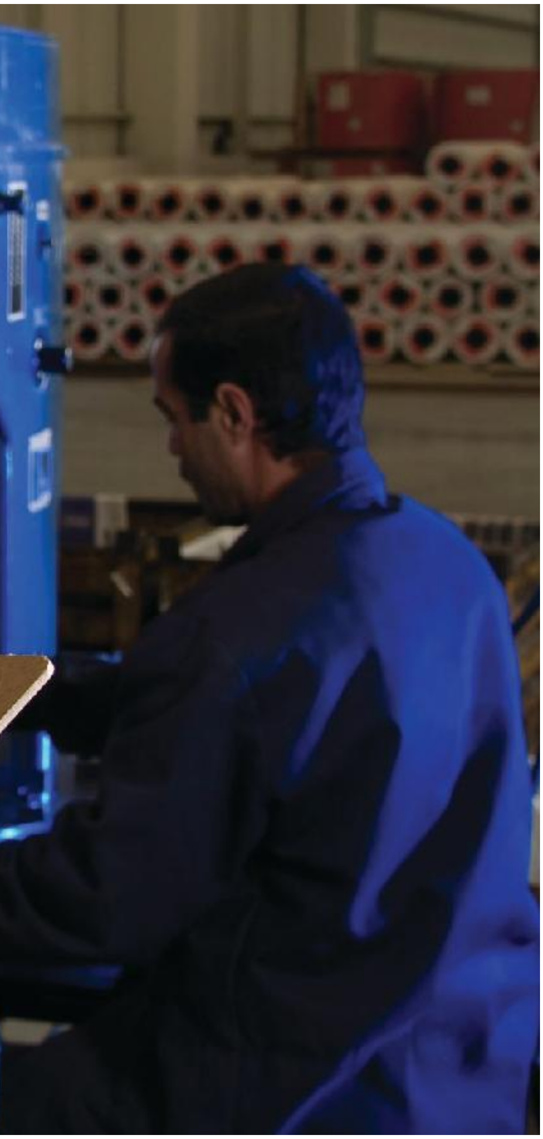
BY J.J. KELLER

Written safety plans are evidence that management is proactive about safety and compliance, but it isn't necessarily evidence that your safety and health management program is in compliance. Therefore, it's important that written safety plans effectively describe compliance issues, safety procedures and associated responsibilities. However, more often than not, written safety plans don't include the necessary elements to successfully define and direct your safety efforts.

Style and substance

Perhaps the most important rule of thumb to use when writing any type of document is to know your audience. When writing your safety plans, direct the substance and content of the message to the individuals who will need to work with or from the plans. The more closely related to the actual conditions your employees will encounter on the job, the more useful the

PHOTO: LEVENT KONUK



plan will be.

Use terminology and a writing style that is accessible. Where possible, consider the educational level and familiarity with the terminology used for those who will be reading the plans. State exactly what you mean in plain language.

Ensure that the written plan is complete, however. Economy of expression is commendable until you discover that a vital piece or section of necessary information has been deleted or left out. Be especially wary to include enough information in the regulatory-required written plans.

Flexibility

A written plan should leave room for discretion. For instance, if a plan on inspections includes a detailed checklist, it may create the impression that the company will only follow that checklist. This can prevent the flexibility necessary to ensure a thorough inspection is conducted when other safety issues or concerns arise during a walkthrough.

Obligations

Read OSHA regulations carefully to make sure your policies don't create obligations beyond the scope of the law. If the details are too complex to summarize, include a phrase such as, "contact [person or department] for more information" or even simply, "review the [regulation, Summary Plan Description, or other document] for full details."

Outdated information

Keeping up with regulatory changes and enforcement activities is always a challenge. All too often, these issues require a change to your plans, or may even require a new plan. For example, several states have their own safety and health requirements that may change more often than federal requirements, which could have a significant impact on your company.

Unwritten rules

Many companies have unwritten rules about how certain tasks are performed, or why certain activities are prohibited. Unless they're written down, however, there may not be any consistency to enforcement – or any enforcement at all. This can not only create problems when enforcing safety polices, but can lead to liability or fines if employees don't follow a procedure that hasn't been documented or communicated.

Talk to supervisors and even to employees to determine if you have any unwritten rules that are currently being communicated verbally. You may find a few procedures that should be written down.

Conclusion

The main purpose of any written plan is to set standard safety procedures for daily, weekly, monthly and annual activities. Setting standard procedures saves money by streamlining efforts and providing an ongoing effort that keeps safety a high priority. The effort to develop effective written plans takes time, but in return it helps ensure safety compliance.

J. J. Keller and Associates Inc., is a compliance resource firm headquartered in Neenah, Wis. It provides safety and compliance solutions to manufacturing, environmental, chemical processing, construction, food safety, mining and more. Visit www.jjkeller.com and www.kelleronline.com. J. J. Keller & Associates is not engaged in rendering legal services. If legal counsel is required, seek the services of a competent professional.

EMPLOYEE EMPOWERMENT

GETTING OVER THE "them vs. us" MENTALITY

BY PAT HEYDLAUFF

Maximizing the productivity of workforce talent is the greatest leadership challenge in today's marketplace. Increased efficiency and productivity means increasing razor-thin profitability. The answer lies in connecting the communication dots by tying workforce productivity to the company's performance.

The thought process of "them vs. us" is the root cause of this challenge and also where you begin to find the solution. Those who seek success without regard to relational costs to the workforce may succeed at first but will lose in the long run. Focus must be placed on what brings leadership and the workforce together, not what creates a chasm of distrust, disharmony and disregard for everyone, including the company.

Engaged leadership improves performance. Leadership's primary focus should be on improving their effectiveness in engaging their workforce. The more engaged employees are, the more invested they are in the outcome, which means improved organizational performance and increased profitability. When you tie workforce productivity to company performance, everyone wins.

A recent Harvard Business Review Study "Connecting Workforce Analytics to Better Business Results," rated productivity flexibility, collaboration and engagement as the most important workforce attributes, noting that engagement is key. The human resources director of one European study participant stated, "At the end of the day, the performance of our staff can mean more money or not."

The study further stated that the biggest difference between organizational failure and success is having a formal approach to workforce planning and optimization. While there are many considerations when developing a plan, it should include the following elements.

Focus on the outcome. In order to maximize workforce productivity and organizational performance, the plan must be developed with focus placed on the desired outcome. The desired outcome must come first and must be measurable. Leadership from all areas of the organization, whether directly impacted or not, should be involved in this step. What one department leader might believe is the desired outcome might conflict with another leader's ongoing operations or size of the workforce. Get all of the negatives out on the table as well as the positives. The outcome must also be supported 100 percent by the team. Inside sabotage will easily create unnecessary slowdowns and distractions.

Sometimes the "how" will also be developed in this step although the likelihood for greatest success will happen if it is developed in the next step.

Connect productivity to organizational outcomes. Communicate, communicate, communicate! It is leadership's mandate to communicate not only the new desired outcome but why it is important to the workforce, how the new outcome will improve the performance of company – and in turn – how this benefits the workforce. This step is critical for tying workforce performance to the organizational outcome. This type of communication must be circular or orbital in nature. It cannot be a one-way street. Leadership must have the workforce play back their understanding of the outcome and how it benefits them and the company. When you get this step right, everything else will go smoothly.

Once the orbital flow of communication has effectively been implemented, proceed with creating the "how" by involving everyone on each team in the process. This is where the best innovations are given life. This is also the step that will provide the best employee buy-in. Be sure the "how" step includes measurable results.

Develop programs to enhance effectiveness. Next it is time for the original leadership team to reconvene and determine what training and new skills might be required by the workforce to enhance success of the outcome. Some evaluation should also be done at this stage to determine if certain employees need to be mentored for future leadership needs. Develop the programs necessary to nurture future leaders and upgrade the skills of the workforce. That is part of the benefits for the workforce and needs to be effectively communicated once the decision is made.

The success of this plan is determined by how well you communicate and engage your workforce. Productivity is not based on a "them versus us" mentality, but rather a more productive and profitable "we."

Pat Heydlauff works with organizations that want to create an environment where employees are engaged, encouraged and involved, and with people who want to be in control, anxiety-free and confident. Reach her at (561) 799-3443 or www.engagetolead.com.

HEYDLAUFF

How productive are your maintenance workers?

You might be surprised how little time maintenance workers actually spend maintaining your facility

BY JOEL LEVITT

If time is money, there's a good chance that your maintenance department is wasting a lot of both. That's because, in a typical day, maintenance workers spend only about a third of their time doing actual maintenance work.

These statistics were based on surveys done at heavy industrialized plants in the U.S. and may be different from the levels of productivity in any individual plant. The low level of actual maintenance work is very frustrating for many of the top maintenance workers. The inability to exercise one's craft and feel the satisfaction of a job well done makes people seek other employment.

The cause of the low productivity cannot be attributed to the workers (it is common to blame the workers). In fact, almost every loss of productivity can be traced back to some well meaning management decision.

In a 480-minute day in a heavy maintenance situation a typical maintenance worker will spend:

PHOTO: DIGITAL VISION

Receiving instructions	24 minutes
Obtaining tools and materials	57 minutes
Travel to and from job *(both with and without tools and materials)*	72 minutes
Coordination delays	38 minutes
Idle at job site	24 minutes
Late starts and early quits	24 minutes
Authorized breaks and relief	48 minutes
Excess personal time *(extra breaks, phone calls, smoke breaks, slow return from lunch and breaks, etc.)*	24 minutes
Subtotal of non-productive and marginally productive	**312 minutes**
Actual work accomplished *(as a percentage of a 480-minute day)*	**168 minutes**

How could we save time by improving the preparation for jobs? One factor is preplanning and arranging for resources to show up when the job is starting. That can dramatically reduce the stopping and starting that is typical on unplanned maintenance jobs.

In an unplanned job, every resource has to be determined then obtained. Small maintenance jobs and service work are the least productive because the ratio of productive to non-productive time is the least favorable. Even in the worst maintenance situations, the more the maintenance job looks like construction (replacing 400 feet of pipe line) the more productive the workers generally are.

Most industrial maintenance departments will plan large jobs (even if the planning is done by the maintenance worker just before the job starts.) Almost all maintenance departments will plan shutdowns because of the large negative impact on revenue of having the plant out of service.

In a planned maintenance job, the resources are obtained at the beginning and the job is executed without interruption (when everything goes well).

Keep in mind that in all likelihood, your best workers already work like this even if they are using a scrap of cardboard and a stubby pencil to plan their jobs! The planning effort is to make the average and lower workers work at this level.

One informal rule of thumb is that each dollar invested in planning typically saves three to five dollars during work execution and the duration of a planned job is commonly only half as long as that of an unplanned job.

Joel Levitt has trained more than 15,000 maintenance leaders from 3,000 organizations all over the world. Since 1980, he has been the president of Springfield Resources, a management consulting firm that serves clients of all sizes on a wide range of maintenance issues. He has more than 25 years of experience in many facets of maintenance, including serving in the roles of process control designer, source equipment inspector, electrician, field service technician, merchant marine worker, manufacturing manager and property manager. Learn more at www.maintenancetraining.com.


LEVITT

PRODUCT PROFILE

PULLERS
pull their weight

Select the right puller, and you can make bearing, pulley or gear replacement a one-man job

BY CLAIR DAVID URBAIN

You'd be hard-pressed to find a maintenance department that doesn't have at least a few pullers in the tool crib. These mechanical marvels can get a grip on even the most obstinate pulley, bearing or gear and slowly, gently slide it off the shaft for repair or replacement.

Two- or three-jaw models

Typically, you'll find the units in two- or three-jaw configurations, says Debbie Dramstad, marketing specialist at Posi Lock Puller Inc. "The two-jaw models are great for use in tight spaces and the three-jaw models more evenly distribute the pulling force around the gear, bearing or pulley."

Physics is your friend when it comes to using pullers. The two or three jaws hook to the outside of the item on the shaft. As the center bolt pushes against the shaft, the jaw head slowly and evenly pulls the jaws and the part being removed with it.

"It's impossible to predict the exact force that will be needed for every pulling operation, but you can refer to torque curves for expected tonnage needed to remove the part. The size, shape and condition of the part and shaft all affect the amount of pulling force needed to remove the part," she says.

MODEL 116

MODEL 216

Puller selection

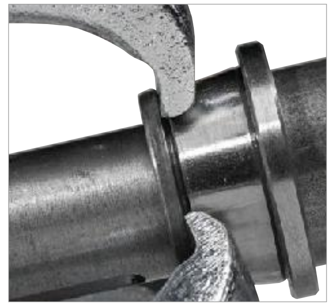
Pulling press-fit parts off of shafts is exacting and requires a firm grasp and a steady force. That can only be accomplished by selecting the appropriate size of puller for the job.

Posi Lock offers two- and three-jaw pullers ranging from one to 40 ton capacity, as well as accessories and specialty pullers. Posi Lock pullers have an exclusive cage guide that makes part pulling a one-man operation in most cases. The Safety Cage controls the jaws for fast set up, solid contact and superior safety, Dramstad says. "They also have a recessed nut to avoid mushrooming and damage from impacts and a center bolt with threads designed to apply more torque with less effort."

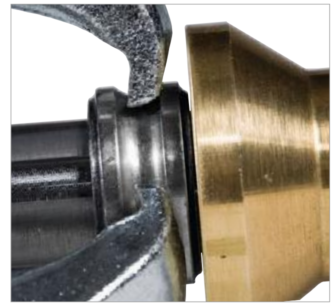
PHOTO: CHRISTIAN LAGEREEK; POSI LOCK PULLER INC.

With Posi Lock, pulling a bearing is strictly a one-man operation. The T-handle and Safety Cage control the jaws at all times. This means that opening, closing, locking and aligning of the jaws are all done automatically by simply turning the T-handle.

Tapered jaw allows clamping around bearing for a perfect pull



Tapered roller bearing on shaft



Lock-on ball grooves and bearing races

To select the proper puller, first identify the reach needed to pull the bearing, gear or pulley. Puller reach is the available distance between the pulling surface of the jaw and the jaw head of the puller. This distance varies and decreases as jaws are opened.

The second parameter is puller spread, which is twice the distance from the center bolt to the pulling surface of the jaw. The puller's spread must be large enough to allow the puller's jaws to grip the outer edge of the part being removed.

Next, consider tonnage, which is the amount of pulling force that can be exerted safely by the puller. It can be estimated by looking at torque curves; however, a general rule of thumb is that the center bolt is at least the same diameter as the shaft from which the part is being removed.

Each pull is different due to the amount of force used to press-fit the part and if there is any corrosion on the shaft. It's a good idea to clean as much corrosion and contamination as possible off the shaft before beginning the pull.

Safety first

Pullers can exert extreme forces on components and those who use pullers must make safety their top priority, says Dramstad. She offers several tips that can help assure safe operation:

1. Always use a puller that is equal to or larger than the part being pulled.
2. Inspect the puller before each use and replace any damaged parts with authorized replacement parts.
3. Wear safety goggles when using a puller.
4. Tighten pullers only with hand tools, not impact wrenches.
5. Do not alter a puller by using heat, welding or grinding.
6. Support the puller and the object being pulled.

Patented design

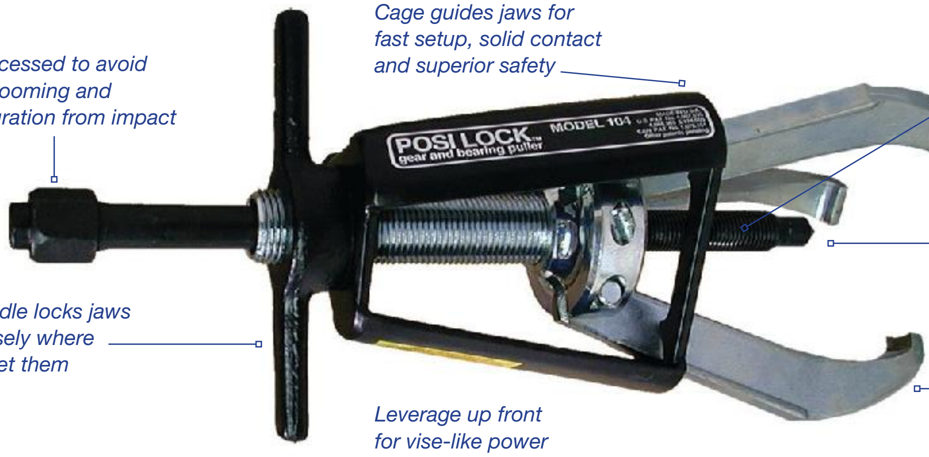
With many brands of pullers available, users of Posi Lock pullers benefit from superior

CONTINUED ON PAGE 38

Puller user tips

1. Select the right puller size for the job. Typically, the puller's spread should be the same or slightly greater than the part being pulled. The puller's center bolt should be the same size as the shaft which it presses against.
2. If possible or needed, clean off any corrosion, burrs or debris on the shaft that could impede pulling forces. Lubricate the shaft with penetrating oil or other lubricant before making the pull.
3. Adjust and fit the puller for best grip on the pulley, bearing or gear. Adjust the jaws and T-handle of the puller so it fits tightly around the part to be removed.

4. Lubricate the center bolt to aid in force transfer from the tool to the part being removed.
5. Slowly twist\turn the center bolt, making adjustments to assure the center of the center bolt matches up with center of the shaft from which the part is being pulled.
6. Continue twisting\turning the center bolt so the jaws exert even force on the part being removed.
7. Never use an impact wrench or other power tool to drive the center bolt.



design that makes them easier to use, Dramstad says.

The patented Safety Cage and T-handle design controls the jaws at all times, making pulling tasks a one-man operation. "This means that opening, closing, locking and aligning the jaws is all done automatically by simply turning the T-handle," she says.

The tools also feature lock-on ball grooves and bearing races and a tapered jaw design that allows clamping around bearing edges for a perfect pull. Also, the center bolt's thread design allows users to apply high torque with less effort.

Industry-leading warranty

Because pullers operate under extremely stressful conditions, look for a warranty that truly stands behind the product, says Dramstad. "Posi Lock offer a lifetime warranty on all its forged parts, except on transmission jaws. All other Posi Lock parts and components are guaranteed for one year against defects in materials and workmanship to meet the exacting standards and requirements of professional maintenance," she says.

INDUSTRY

Where pullers are used:

- Logging
- Railroad
- City/county/state maintenance departments
- Automotive shops
- Salvage yards
- Steel mills
- Mines
- Processing plants
- Dry cleaners
- Vending
- Aviation
- Shipyards
- Power plants
- Printing presses
- HVAC
- Hospitals
- Hotels and restaurants
- Casinos
- Recycling centers
- Manufacturing plants
- Oil fields
- Wind farms
- Paper mills

EQUIPMENT

Jobs pullers do:

If the piece of equipment has a shaft, it's likely a puller will be needed for repairs. Across many industries and types of equipment, these tools are extremely valuable for making repairs. Some examples where pullers are used:

- Boat motors
- Small engines
- Starters
- Conveyor belts
- Golf carts
- Lawn mowers
- Timing gears
- Snowmobiles
- Motorcycles
- Battery terminal removal
- Air compressors
- Washing machines
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Dealing with DIFFICULT customers

BY CHUCK SUJANKSY

My youngest daughter recently took a summer job as a customer service rep at a national car agency. She's found most of her customers to be pleasant and reasonable, but she recently had to deal with a woman who hated everything about the rental car she was assigned. She didn't like the size of the car – or the color – or the condition. The woman had my daughter running ragged trying to deal with all of her complaints and issues, including the customer's insistence that the vehicle had water spots leftover from the last car washing!

We've all heard stories about notoriously poor customer service representatives and incidents where customers were frustrated, insulted or ignored beyond belief. Poor customer service is inexcusable, but there's another side to that coin. There are also tales of impossible, demanding customers who treat customer service reps like dogs. It makes you wonder at what point the customer ceases to be "right."

Customers from hell

There's no excuse for any business to provide poor customer service. Customers pay the bills and drive profits. But customers also sometimes drive customer service reps to distraction! America Online's Daily Finance website invited visitors to contribute stores about "customers from hell." Among the nightmares that readers reported were:

- The customer who complained when the anchovy pizza she ordered contained "fish."
- Or the customer who insisted that there was too much oxygen in her water.
- Then there was the pharmacy customer who was upset because he choked on the suppositories he'd been prescribed.
- And, not to be left out, there was a tire store customer who insisted that the designs on all four wheels had to uniformly face up before she left the shop.

The myth and the reality

It may be easy to laugh off sales of customers behaving badly. The sad truth is that customers generally have more to complain about than your customer service reps do. A recent survey conducted by the Profiles International Research Institute found an alarming disparity between how organizations evaluate the quality of their own customer service and the reality of how their customers actually viewed the service.

Out of 362 organizations surveyed, fully 80% believed they offered superior customer service. However, when their own customers were surveyed, only 8% said they had received a superior customer service experience by those companies!

Developing thick-skinned customer service

Obviously an employee who's sufficiently thick skinned can deal with demanding customers in a calm manner without taking the conflict personally. But being "thick skinned" requires more than just a calm demeanor. "Thick skinned" employees also possess a range of skills and competencies. These are successful at acknowledging

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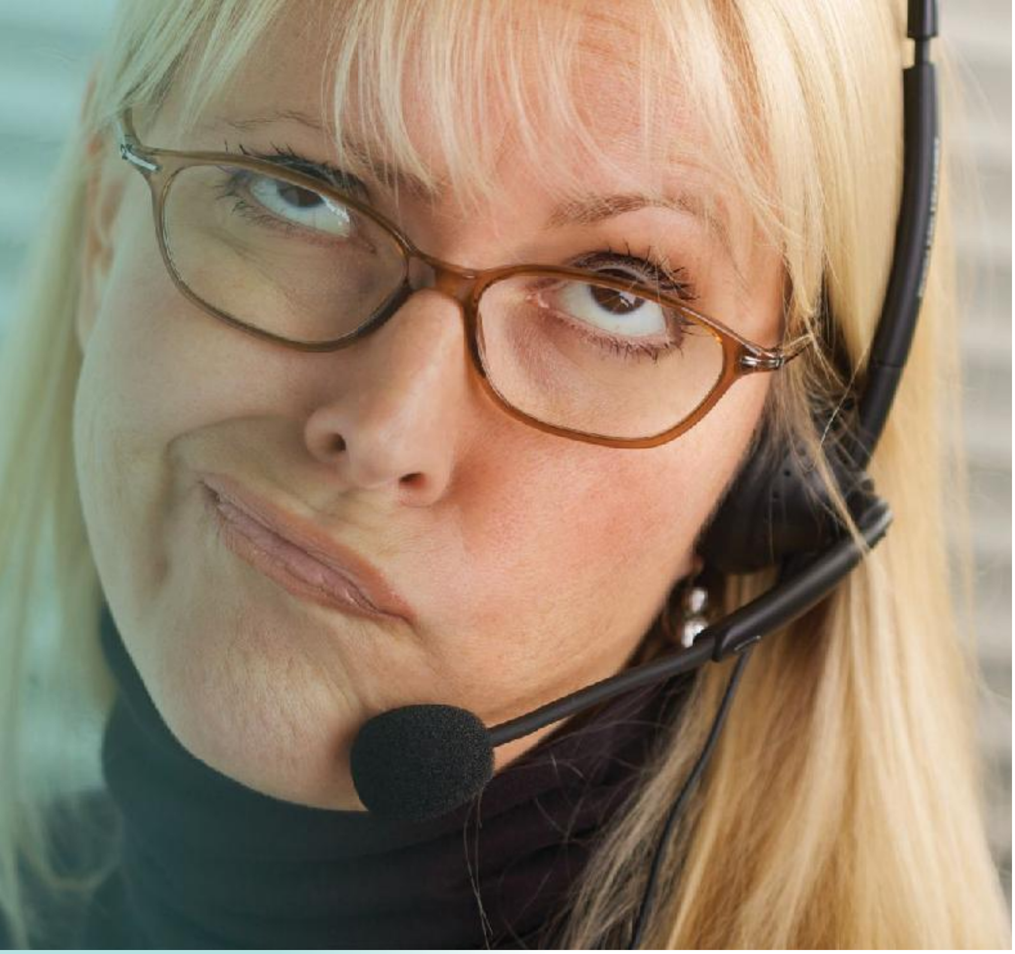

Working with some customers requires developing a thick skin

the problem, demonstrating empathy to the customer and finding solutions. But to accomplish those goals your frontline customer service reps must also possess a specific set of skills. The Profiles International Customer Service Profile pinpoints six crucial behaviors for successful customer-facing employees:

Trust – This means accepting that your customer's motives are honorable. Reps who lack a fundamental sense of trust are likely focused on the validity of the problem rather than a solution, making your angry customers even angrier.

Tact – It's important for your customer service reps to be able to state their positions without being offensive or rude. The bottom line is this: how you say something to a customer can be just as important as what you say, especially when emotions are running strong.

Empathy – You want your customers to feel that your organization cares about their experience. Even if your customer service reps can't help their customers, they need to at least acknowledge the customer's situation and frustration.

Conformity – Some organizations require their reps to carefully follow rules and guidelines. That means appointing reps who possess a higher degree of conformity. On the flip side, reps with lower levels of conformity may be more inventive, unconventional or independent. Having the right fit in your customer-facing departments can be crucial for creating outstanding service.

Focus – Your customer service reps are responsible for maintaining a high focus on satisfying their customers. Highly focused people tend to stay on the task regardless of distractions and they're usually more effective in meeting customer expectations.

Flexibility – Highly flexible reps tend to explore new approaches to doing things and are more adaptable, accepting and open-minded. Less flexible reps may prefer repetitive tasks and are better suited for customer interactions that involve routine tasks and procedures.

At the end of the day, customer service reps that possess a thick skin are more likely to function well in stressful situations. Fortunately, there are tools you can employ to help your customer reps "develop a thicker skin," just by making sure they have the skills and strategies necessary to make your dissatisfied customers happy.

SUJANSKY

Chuck Sujansky is CEO of KEYGroup, a 30-year international speaking, consulting, assessment and training company with headquarters in Pittsburgh, Pa. Learn more at www.keyemployeeassessments.com.

INNOVATION CENTER

Show me the MONEY

How to use MRO item analysis to uncover significant cost savings

PHOTO: NDOELJINDOEL

BY I.M.A. LTD.

Like many companies, you probably have a lot of money tied up in MRO inventory. The real question is how to turn that unnecessary evil into significant cost savings.

Historically, companies never actually owned the inventory they stocked, which meant there were very few, if any, repercussions of having excess items on hand for emergencies. The only type of inventory management process was the annual physical count undertaken for financial reporting purposes.

With such poor management procedures in place, it is no surprise that, over time, inventory levels continuously grew to the point where the numbers were simply too large to ignore. Something needed to be done.

Ironically, maintenance workers had very little confidence in technology and electronic inventory data. They did not trust that parts were actually stocked in the quantities stated or that they were still usable. In many cases, workers would keep a private stash of parts hidden somewhere for their own use or even by-pass the computer system all together by ordering parts directly from the supplier. These scenarios were not uncommon and added further to unnecessary costs.

Formal inventory reviews often found that many item descriptions are inadequate, had spelling errors or were missing information such as manufacturer name and/or part number. Often, the part description is unrecognizable to maintenance workers, which leads to part duplication, false stock-outs, equipment downtime and poor maintenance efficiency.

Before an inventory analysis can take place, all inventory data must first be cleansed, since a benchmarking activity requires that you know your starting point. The data cleansing process ensures that all data is consistently standardized, missing information is filled in, duplicates are identified and all items are assigned their correct UNSPSC code.

Once the original data has been cleansed, we typically find that duplicate items range from 5-15% within a given site and the percentage of commonality across multi-site organizations can sometimes range as high as 25%.

Next, inventory can be sorted into typical commodity groups: Bearings, Industrial Supplies, Electrical, Instrumentation, Fluid Power and Pipe, Valves & Fittings.

Commodity groups can then be segmented into categories based on usage: Required Active, Excess Active and Inactive. Required Active parts are used commonly and must be stocked at all times. Excess Active parts are overstock of Required Active items. Inactive parts can be further segmented into Critical Spares, Slow-Moving or Obsolete Materials.

Critical Spares include items that are essential for the business to operate and stocking out would significantly impact production, quality, safety or costs. Slow-moving items include parts with long lead times which may affect plant efficiency, or recommended spare parts which are kept to satisfy risk aversion.

Optimization and rationalization of the above mentioned categories requires a very strategic approach but can return significant cost savings.

Typically, we find that Required Active items range from 25-30% of all inventories, Excess Active items range from 10-20% and Inactive items range from 50-60%. Further, we consistently find that within all Inactive inventories, Critical Spares represent 15-20%, Slow-moving items represent 20-25% and Obsolete items represent 15%.

The opportunity for cost savings predominantly comes through eliminating duplicate items and rationalizing Excess Active and Slow-Moving inventory. These items can be used down through attrition, sold back to the supplier for credit toward future purchases or sold to a third party for cash. In some cases, obsolete items can also offer opportunity for generating cash.

Inventory optimization and rationalization can return significant cost savings

Case study

A recent case study illustrates typical findings from an MRO Item Analysis. A multi-site manufacturing organization with 11 locations decided to undertake a pilot inventory analysis project at four Wisconsin sites. If the project was successful and returned enough value, it would be extended across the entire corporation.

The cleansing process was completed across all four sites in which item descriptions were standardized into noun/modifier format, using industry nomenclature, and a corporate catalogue was created to consolidate all items. Site by site, the cleansed data was first sorted for duplicate identification, and then segmented into categories by commodity group and analyzed based on usage and supplier.

The results of the project were impressive. Duplicate items represented approximately 9% of inventory. The item bins were consolidated and overstock would be used down through attrition.

Approximately 20% of inventory items were found to be at excess stocking levels. These items were returned to the supplier for credit, yielding cash savings of $1.1 million. Obsolete materials were identified and disposed of, generating $100,000 in cash.

A long-term plan was designed to address slow-moving inventory items to determine the value/life of the part and its appropriate stocking level.

Finally, the company decided to share highly valued spares within the regional area, further reducing stocking levels at all four locations.

With a return of more than $1.2 million, the pilot project was deemed a success and was later implemented at the remaining seven sites.

MRO inventory ties up a large amount of money, especially in multi-site manufacturing and asset-intensive organizations. It requires strategic planning and a professional inventory analysis project to reveal the hidden savings within maintenance stores inventory. With a little effort, you too can turn your necessary evil into a corporate good.

This article was adapted from a white paper by I.M.A. Ltd., Tillsonburg, Ontario, Canada. The company provides world-class materials master data management solutions, specializing in maintenance, repairs and operations (MRO) inventory. Contact I.M.A. at (519) 688-3805 or info@imaltd.com.

Lower the anxiety associated with CHANGE

Recognize the positives and eliminate the negatives

BY TOM SOMODI

Have you ever asked yourself, "Why do I experience anxiety when I am facing change in my life?"

To answer this question, start by thinking of your replies to the following scenarios. Which do you think has the potential of creating more anxiety?

1) *Taking a bus to work in the morning or having an operation to repair your knee?*
2) *Rearranging a room of furniture at work or moving an entire business to a new location?*
3) *Driving your car across town or flying on an airplane across the country?*

While the answers seem absurdly obvious, there are differences between the examples that are relevant to understanding the relationship between anxiety and change.

In the first question, a knee operation is a more significant event than taking a bus to work. So the level of *significance* associated with a specific change tends to influence the potential anxiety you experience.

In the second question, the level of *difficulty* determines the potential for anxiety. It is far more difficult to move an entire business operation to another location than it is to simply rearrange a few pieces of furniture. The more difficulty you associate with a change, the more likely you are to experience anxiety.

Finally, the third question raises the issue of *control*. When you are driving the car you are completely in control. Generally speaking, you experience less anxiety when you are in control than when you are not in control, as in the case of relying on an airline and its pilot to fly you where you want to go. Having control of a situation often greatly reduces the level of anxiety associated with a change, even when that change fails to occur.

A lack of control can also be associated with the unknown. Even though a change might be fairly simple, if an individual, organization or society faces a change that contains many unknowns, the unknowns create a feeling of a lack of control. This increases the potential for anxiety.

For example, if you have never taken a train before or if you are in a new city, you may experience anxiety because the unknown creates a lack of control that increases the potential for anxiety. If you continue to take this same train in the future, chances are your

PHOTO: STÄFÄ©PHANE BIDOUZE

anxiety will decrease as you become more familiar (that is, more experienced with the change), resulting in a feeling of being more in control.

It is also important to realize that *significance*, *difficulty* and *control* are not just individual characteristics but are, in fact, dynamics that can interact with each other relative to the same change. For example, a change can be very significant, but if you believe you have a great deal of control over the change, the anxiety that might otherwise exist can be tempered or even completely negated.

So the level of significance, difficulty, and control play a considerable role in the amount of anxiety associated with any given change we face and the following rules can be applied:

- *The greater the significance associated with a change, the greater the potential for anxiety.*
- *The greater the difficulty associated with a change, the greater the potential for anxiety.*
- *The greater the control you have associated with a change lowers the potential for anxiety.*
- *Significance, difficulty and control can interact simultaneously, creating a set of mixed dynamics.*

It is important to note that these rules apply to us not only as individuals but also as organizations and societies. In fact, much of history has been influenced by the anxiety associated with the change an organization or society faced. For example, there is a good chance that you have been employed by, or maybe even managed, a business that completely reorganized itself because of its anxiety about its ability to remain competitive in the changing marketplace. Or how about a society that went to war because of its anxiety over an actual or perceived loss of control in its access to food, water or other resources.

Now that we have established the main drivers behind anxiety and change, is there a why behind these relationships?

The answer to "why" exists in the fact that you realize that you are not always successful in obtaining the change you desire. If you know that the change you desire will always take place, there would be no reason to have any anxiety. However, through experience, you have come to recognize that a desired change cannot be guaranteed.

From the time you were a baby, you have accumulated a vast conscious and unconscious knowledge base relative to change. This knowledge has inherently provided you with the ability to realize that change is not guaranteed and helps you recognize that significance, difficulty, and control can play a major role when attempting to obtain a desired change.

It has also inherently created a defense mechanism in the form of anxiety that helps bring certain change from the unconscious to the conscious where you are more likely to focus on it relative to everything else going on in your daily life. Even though in the end there might not be anything you can do about increasing the potential for success, this anxiety response provides you with an opportunity to focus on the desired change with the hope of increasing the chances for a successful change.

Is this set of dynamics good or bad? I believe that the answer is generally positive. While anxiety can sometime paralyze us or create negative consequences, these emotions are in fact the natural response associated with bringing issues of change into the forefront of our conscious attention. This helps us focus on changes that require immediate awareness.

In the end, this new found understanding of the relationship between anxiety and change should help you recognize the positives of the anxiety response while eliminating some of the negative aspects of anxiety by providing a basis for you to focus on and leverage the underlying drivers of significance, difficulty and control.

Tom Somodi is a speaker and expert in the areas of domestic and international reorganizations, acquisitions and strategic change initiatives covering manufacturing, distribution and service sectors. His forthcoming book, The Science of Change: Basics Behind Why Change Succeeds & Fails, *is expected to be released in the Fall of 2013.*

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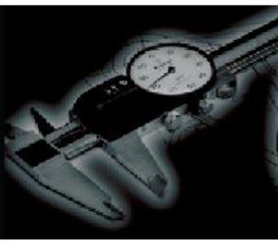

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