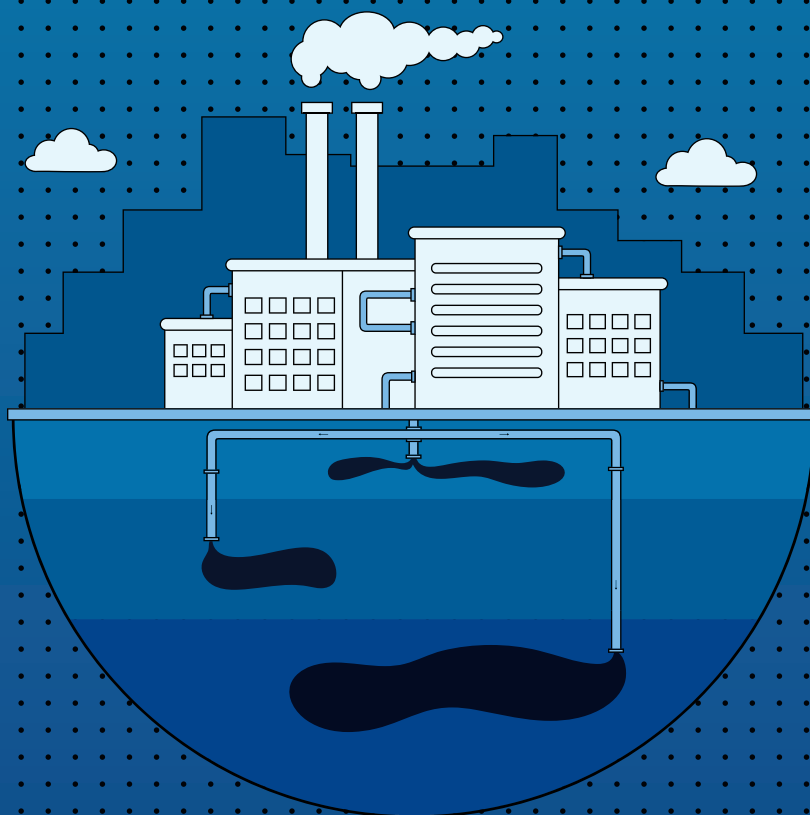


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ZERO TO 100% TO INFINITY



by JAKE LOCKLEAR

TAUC PRESIDENT
PRESIDENT AND CEO, APM

***Safety is not the absence
of failures; safety is the
presence of defenses.
– Todd Conklin***

*Pre-Accident Investigations: An
Introduction to Organizational Safety*

YOUR FOOTBALL TEAM is up by three points. The clock reads two minutes left in the fourth quarter. Your defense just stopped the opposition, and you have the ball at the 20-yard line. You need one first down to run the clock out and win the game. You approach your quarterback and running back to make one impression. What do you say?

“Don’t fumble.”
Or --
“Protect the ball.”

In my experience, you say “Protect the ball.” Why?

Saying “Don’t fumble” focuses your players on a negative outcome. It puts into their mind the one thing you don’t want them to do. They visualize a fumble – they see it happen. They start thinking about all the things that can go wrong if that error occurs. That scenario may be appropriate in the film room or in a “lessons learned” debrief, but not in the moment of play.

Saying “Protect the ball” focuses your players on a positive. It puts into their mind what you want them to do. Further, the beauty of this statement is that not only do they visualize a positive outcome, but they also visualize the positive actions (and behaviors, commitments, and disciplines) that lead to the positive outcome. They see themselves doing the specific things that lead to protecting the football – a clean handoff in the mid-section, five points of contact on the ball, covering with two hands when entering a crowd, and so on. Thus, your players think about all things they can do right that lead to a positive outcome.

Now let’s take this analogy from the ball field to the job site. In the toolbox talk at the start of the day,

what do you tell your crew: “Don’t get hurt” or “Let’s be safe”? I strongly recommend we say “Let’s be safe.” This statement puts into the crews mind both the positive outcome and the specific actions that lead to that outcome. Maybe you’re preparing for a lift that day. “Let’s be safe” has the crew thinking of all the actions it takes to be safe – preparing the lift plan, inspecting the rigging equipment, having the proper roles assigned to the proper individuals, etc. Thus, your crew is both visualizing the specific actions needed to execute the lift properly and a successful lift.

Let’s also take this analogy to the board room. How do you measure safety success in your organization? We often measure safety success by one number: 0. Zero, i.e., no one injured, is a worthy goal. Yet zero is also an outcome based on the absence of failure. No one was injured, and thus we were good today. Is that true? Zero could be just as much attributed to the presence of luck as it is the presence of defenses.

This is one reason why truly great organizations that strive for safety excellence/perfection focus on leading indicators – the positive actions that lead to the positive outcomes. Great organizations don’t focus on injuries, or the lack thereof. Rather, they focus on the actions (the behaviors, commitments, and disciplines) needed to deliver a safe work environment. They measure things like job safety analyses, good catches, STOP moments, etc.

You may be reading this and saying, “Jake, this is Safety 101. We all know this. Why devote time and space on this topic?” Allow me to suggest three reasons why.

First, our industry uses one metric above all else to measure safety performance – the I&I rate. The I&I rate



measures injuries and illnesses – negative outcomes. The perfect number is 0.00 – the absence of injuries, or the absence of failures. It is the equivalent of declaring success by measuring the absence of fumbles, and again, that score may be due to luck more than diligence. It is a worthy result, but not truly the one we are looking for. We have to go beyond the numbers. Thus, I challenge the industry, specifically the leaders in TAUC, to develop a positive metric to measure safety excellence.

Second, later this fall we will celebrate safety performance at the NMAPC's Zero Injury Safety Awards Gala in Washington, D.C. It is a great event that recognizes our contractors, labor partners, and customers who have come together, in the spirit of the tripartite model, to deliver an outstanding result – zero injuries. But wait, didn't I just say that isn't really the result we're looking for? Here's the difference: as you mingle during the gala and speak with the award

winners, I believe you will hear lots of talk about proactive measures and daily disciplines that ultimately led to those results. You will hear less about "zero" and more about "100%" - fully meeting expectations for daily inspections, safety briefings, observation cards, and similar actions. And you will hear an infinite number of stories of behaviors that lead to safety excellence, such as one craftsman stopping a fellow craftsman when he sees something concerning. That's going beyond the pure numbers and getting to the heart of the matter. Thus, I encourage you to attend ZISA with the goal of learning and sharing what great companies are specifically doing to keep craftworkers safe.

Finally, I make an appeal to the greater purpose for which we are in this industry. I believe you are in this industry because you have a passion for craftworkers and for building America. You want to make a difference. If that is your purpose, then is your goal truly to send each person

home at the end of the day without an injury? I believe we aspire to a higher expectation. We want our craftworkers developing the skillsets that will keep them healthy and safe on our jobsites, on the next jobsite, at home, in the yard, in the tree stand, in the community ... We want them building the safety disciplines that are applied to any and all activities. Thus, I exhort all of us to focus on the actions that lead to both a safe job and a safe life.

Let's continue the momentum in shifting our cultures from a zero mentality to a 100% mentality and an infinite mentality. We want cultures that strive for the presence of positive actions, 100% of the time, that lead to safety excellence. And we want cultures that value an infinite number of personal interactions that lead to a safe job and a safe life.

Protect the ball! 

Balancing the Old and the New

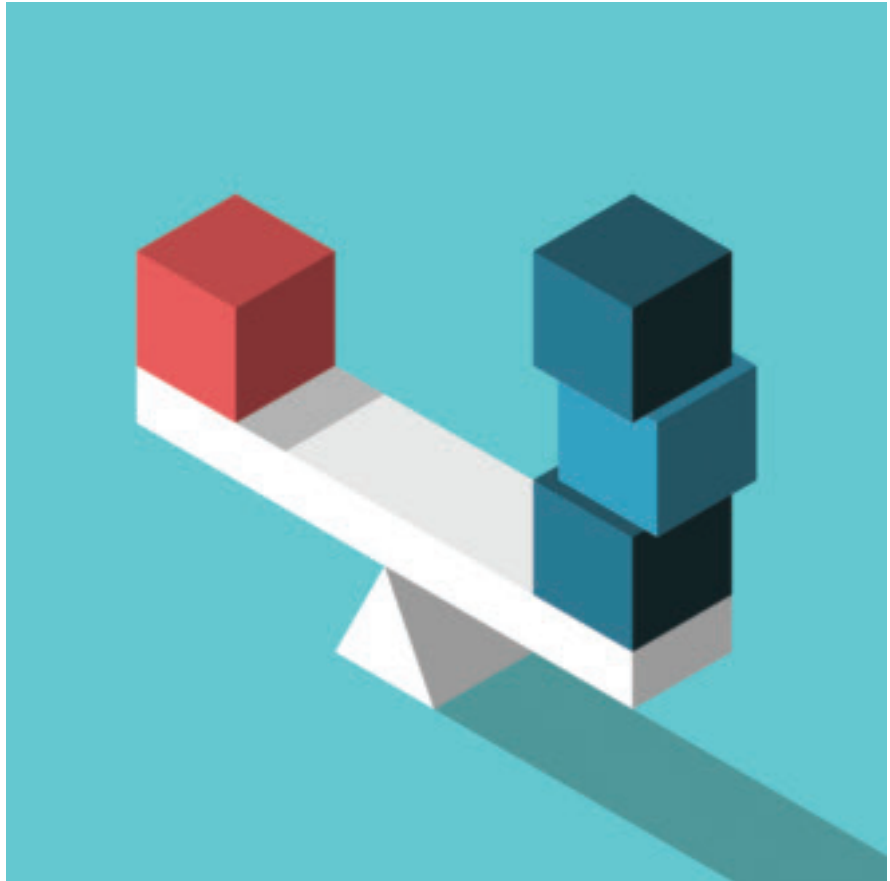
by STEVE LINDAUER

LAST ISSUE WAS devoted to coverage and discussion of TAUC's first annual Industrial Grade Innovation Conference and Expo (IGI), held in Dearborn, Michigan in June. In my column for that issue, I discussed the need for our industry to embrace the promise of new technology, from virtual reality and drones to "bionic" exoskeletons and "smart tools." Just a few weeks ago, our staff and committee members traveled to Towson, Maryland for an exclusive behind-the-scenes tour of TAUC Legacy Partner DEWALT's product design and development facilities. We were given a sneak peek at a new generation of tools that will utilize advanced digital computing power to help craft workers do their jobs more safely and efficiently.

In other words, we here at TAUC have been thinking and talking about technology quite a bit in 2018. It has been one of our main areas of concern, and will continue to stay high on our priority list for the foreseeable future.

But at the same time, there's a potential danger in focusing too much on technology and giving it oversized importance. As TAUC President Jake Locklear said at IGI, innovation is great, but it's not a "magic bullet" – it won't suddenly transform your business into a juggernaut and cause owner-clients to start beating down your door. The big risk is pouring too much time and attention into these amazing new inventions and ignoring – or giving lip service to – our industry's fundamental strengths, which have nothing to do with microchips or robotic welders.

What are those strengths? Tripartite cooperation; mutual respect between contractors, the building trades and owner-clients; and an absolute commitment to jobsite safety and the zero injury philosophy. Or, to




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boil it down to four simple words that comprise the motto for our sister organization, the NMAPC: Safety, productivity, quality and strength.

The key is to balance our hope in the promise of technology with a renewed dedication to core principles. We can't live in the future, nor can we dwell in the past. It would be foolish to think that new innovations in tools and software give contractors an excuse to "ease off" and stop cultivating relationships with our union partners and owner-clients. However, it would be equally dumb to resist any advance in technology as an assault on our current ways of thinking and doing business. Both can – and should – exist together in harmony.

That's why I am pleased to announce the creation of a brand new honor, the TAUC Joseph R. La Rocca Union Project of the Year Awards (www.tauc.org/larocca). The awards are dedicated to upholding the timeless principles on which our organization was founded. They recognize contractors who execute those principles in an exceptional manner – and that includes using the "latest and greatest" technological innovations to get the job done in a safe, efficient and professional manner. In this way, both aspects of our industry – the timeless and the timely, the abstract and the concrete – are simultaneously honored.



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The key is to balance our hope in the promise of technology with a renewed dedication to core principles.

The La Rocca Union Project of the Year Awards will recognize outstanding work performed under labor-management cooperation and will be judged under the following four criteria: collaboration/teamwork; construction quality and craftsmanship; project execution/scale; and safety. In addition, there will be three award categories, for projects of less than \$5 million; \$5 million to \$50 million; and above \$50 million. All current TAUC Governing Members in good standing are invited to apply.

The Awards are named after Joe La Rocca, a true pioneer in the union construction and maintenance industry who is still going strong today – some of you may have met him at last year's Leadership Conference in Santa Barbara. He served as Executive Vice President of TAUC's predecessor organization, The National Erectors Association, from its inception in 1969 until his retirement in 1986. In addition, he also served as the first Impartial Secretary of the National Maintenance Agreements Policy Committee Inc. (NMAPC), and was instrumental in spearheading its creation and shepherding its unprecedented growth throughout the 1970s and 1980s.

The impact Joe made on TAUC, and the industry as a whole, is still felt today. His passion for the business and the people who are served by it are a vital part of his legacy. His philosophy was (and is) simple: you don't just serve the contractors, the participating unions and/or the owner; your service is an even higher calling to the union construction industry as a whole. That is a true testament to his — and TAUC's — approach to leadership, and the reason why this new award is named in his honor.

The U.S. military has a time-honored tradition: "Never leave anyone behind." Over the years, soldiers have gone to extraordinary lengths to rescue captured comrades or those stuck behind enemy lines. I think our industry can learn a lot from their dedication. No, we don't dodge bullets or parachute into hostile territory, but we can be inspired by those who do. We can choose to "never leave behind" the principles and standards that have built our careers – and our industry.



Steve Lindauer is the CEO of The Association of Union Constructors and also serves as Impartial Secretary and CEO of the National Maintenance Agreements Policy Committee, Inc. (NMAPC).

If Your People Leave, It's Probably Your Fault: Culture, Purpose and Talent Today

by MARK BRESLIN

MORE THAN TWO million people quit their jobs last year. That number is up 35% in the last five years. One in three people polled say they are considering leaving their existing position. That is one-third of your workforce. Today.

Over 90% of Millennials expect to stay in their positions for less than three to four years.

If the construction industry has a head, it is only in the last several years that it popped out of a very dark place. In the past, leaders in this business (which my family has worked in for four generations) didn't care about culture. They cared about production. They didn't care about "culture" when "authority" is what got the job done. They didn't worry about retention, because the general idea was "If you can't do it, I'll find someone who can." Well, the evolution of culture in construction is underway in a profound manner. And what is driving it is a simple formula. Here it is:

"In today's market, talent will flow to where it is valued most."

Notice I did not say where it is *paid* the most. Money is certainly a mandatory component of the workplace relationship. But I hate to break the news: if you have an employee leave you, most likely it is YOUR FAULT.

Here's why. Based on almost every study (and the younger the employee, the more accurate this is) people work at an organization (and stay there) because of two major drivers. Here they are in order:

1. CULTURE: What is the prevailing culture around employment? This constitutes elements such as:

- How much effort does the company and my boss make to emphasize my value?
- How much feedback do I get on my performance?
- How interested is my organization in developing my talent and career?

- Do my company and supervisor display the commitment, ethics, transparency and work ethic that make me want to emulate them?
- Do they display trust and loyalty?
- Can I do my best work and be my best self in the environment?

Creating this kind of culture takes work. It means being open to change – driving change – and accepting that you have to meet people where *they* are, and not where you are. Or you can try to keep them by paying them more money until they leave anyway.

Continued on Page 29

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The State of Construction Technology: Top Startups Set to Disrupt the Industry

KYLIE ANDERSEN

SENIOR RESEARCH ANALYST
JLL AMERICAS RESEARCH

THOMAS FORR

RESEARCH MANAGER,
JLL AMERICAS RESEARCH

EDITOR'S NOTE: Recently JLL Americas Research published an important new report on the current state of technology innovation within the construction industry. JLL has graciously allowed us to print an edited and slightly modified version of the report below, but we encourage all of our readers and TAUC members to seek out and read the full report at <https://jll.postclickmarketing.com/construction-technology>.

\$1.05 billion.

That's how much venture capitalists invested in global construction technology (ConTech) startups in the first half of 2018, a record high. The investment volume of 2018 is already up nearly 30 percent over the 2017 total —and there's still another six months left in the year. This traction goes to prove ConTech's budding allure to users and investors alike, with investment growth actually outpacing overall tech startup investment growth in the United States. And the hype is grounded, as the arena for successful disruption exists — per a recent global McKinsey study, construction is one of the least digitized sectors in the world, with only agriculture and hunting falling beneath it. In today's world, software, technology and computing power are not universally adopted in construction,

but these startups are working to change that.

It's no mere accident that this uptick in ConTech investing coincides with an industry plagued by cost fluctuations, labor shortage issues and overall lack of productivity improvements—creating what many venture capitalists view as a prime opportunity for disruption.

Let's gain some perspective:

1. Over the last 25 years, based on Bureau of Labor Statistics data, nearly every industry doubled their productivity rate, whereas construction has not only flat-lined, but declined. **Bottom line:** Labor-intensive processes
2. Materials costs are growing at an increasing rate — costs grew by 5.6 percent over the last 12 months, with another 5–6 percent in increases expected over the next year. **Bottom line:** Less product for your buck
3. Access to skilled labor continues to be an issue. The number of construction workers is down 12.9 percent from the 2007 peak. **Bottom line:** Growing project schedules
4. Spending in construction is up 23.3 percent over the 2007 peak, hitting a projected \$1.3 trillion in 2018, compounding the woes of supply and demand for labor. **Bottom line:** Increased rivalry for resources

Construction startup and venture capital activity



Source: CB Insights, JLL Research



WE SALUTE OUR VETERANS

The Join the Salute campaign is an effort to highlight the organizations, both large and small, that honor heroes and support troops. DeWALT shares in the mission of both Flags Of Valor™ and Wounded Warrior Project™ to transition veterans to civilian life and provide opportunities for their future. In tandem with these esteemed veteran-owned and operated organizations, and highlighted by the Join the Salute campaign, DeWALT remains committed to hiring veterans, coordinating employee volunteers, providing tool donations, and making charitable contributions. We invite you to join us in support of veterans.



What to Do When an Employee Becomes a Cybercriminal

by BRYCE AUSTIN

THE FBI CAUGHT DAVID YEN LEE at his home before he could depart for the airport where his flight was waiting. The hard drives the FBI sought were in his possession. On those drives were the trade secrets of a very well-known USA-based paint company, and David had purchased a one-way ticket to Shanghai, China where he intended to illegally hand over those trade secrets to Nippon Paint. He served over a year in prison for his crime.

Today's cybercriminals come at your company from many angles. Their motivations are often more practical than many law-abiding citizens would expect:

1. **Profit.** They want money, and you have information they can monetize.
2. **Influence.** They can use data to manipulate business or personal situations in their favor.
3. **Power.** If your company dominates an industry or owns critical trade secrets, others wish to take that power away from you and use it for their own advantage. Cybercrime is one way to accomplish that goal.

Motives such as these change the way cybercriminals operate. They are organized. They share information amongst each other. They are often well-funded. These things make them more dangerous. In the example above, David Yen Lee is an internal cybercriminal. He is one of your employees.

This is a difficult topic. While it's true that internal employees are responsible for a large number of cybersecurity breaches, it's also true that most of these are unintentional. They are a result of good people doing something they shouldn't, either out of ignorance or because a cybercriminal tricked them into doing it (if you saw the movie *Catch Me if You Can* this is Frank Abagnale's social-engineering behavior). Statistics on the exact percentage of "insider" cyber breaches that are deliberate vs. inadvertent vary widely, but the opinion can be held that the vast majority of insider threats are *not* malicious. No matter which statistic you believe, everyone agrees that many insider threats would have been prevented if the insider had understood how his or her behavior allowed a breach to occur. It's easy

to see why a good cybersecurity awareness training program is so important to the success of your company.

With that being said, there is a risk of an employee with malicious intent to breach your sensitive data, whether it be to share sensitive details with a competitor, profit from your data, or a disgruntled employee looking to carry out revenge against your company. If your company falls victim of a malicious-intentioned employee, finding out what happened is even more difficult because they often have high-level system privileges that allow them to erase their tracks.

If your company is one of the unlucky ones where an insider deliberately caused a security breach, then you are automatically in the highest risk category of those susceptible to cybercrime. The keys to mitigate this risk are simple:



Educate Your Employees

- Establish a strong mandatory and frequent cybersecurity awareness training program for your employees that clearly lays out the policy for cybersecurity and the consequences of violating the policy.
- Don't allow employees to take home devices that contain sensitive files due to the risk of the device being stolen or sensitive data being transmitted over insecure networks at their home or other locations.
- Instruct your employees to never share their passwords.

Know your People

- Perform background checks on your employees to assist in identifying those that may take deliberate actions that would harm your company.
- Know which people have access to the most sensitive data.


Guard your most sensitive data

- Limit your employees' ability to obtain access (intentional or unintentional) to sensitive information via a least-privileged approach to your data.
- Identify your most sensitive and valuable data. Then assign that data the highest safeguarding and most persistent monitoring.
- Remove "local administrator privileges" from your users to their company-provided laptops or desktops. A "local administrator" is someone who can do anything he or she chooses to with a computer, such as install programs, delete files, change sensitive security settings, and so on.
- Turning on "egress filtering" on your network and limiting the use of USB "thumb drives" will make it harder for anyone to make copies of your information and move them outside of your organization.

Ensure that you have forensics available to you

- Tracking down an internal cybercriminal requires logging of network activity, especially for any access to sensitive information.
- Any logs need to be stored in an area that is limited to the fewest number of employees as possible.



In short, your employees are your most valuable asset, but can also be your greatest liability. They need to be trained on best practices to keep your data safe, and they also need to understand that you have forensic systems in place that will likely catch them if they attempt to access data they should not. A "trust but verify" approach regarding employee access to your critical intellectual property is an important part of your company's cybersecurity program. 

About the Author



Bryce Austin is the CEO of TCE Strategy, an internationally-recognized speaker on emerging technology and cybersecurity issues, and author of Secure Enough? 20 Questions on Cybersecurity for Business Owners and Executives. With over 10 years of experience as a Chief Information Officer and Chief Information Security Officer, Bryce actively advises companies across a wide variety of industries on effective methods to mitigate cyber threats. For more information on Bryce Austin, please visit www.BryceAustin.com.

One-on-One Coaching: The Most Effective Way to Develop Your People

by JEFFREY W. FOLEY

EFFECTIVE ONE-ON-ONE COACHING is one of the most important skills a great leader must possess.

Effective coaching inspires in others an internal drive to act ethically, without direction, to achieve goals. Effective coaching drives performance, builds competence and confidence, and ultimately enhances relationships. The best coaches help people find ways to make things happen as opposed to creating excuses why they can't.

Effective coaching also requires you to believe in yourself. You need to believe that you can have an impact in the workplace, and that you can inspire others to achieve their goals they might not otherwise achieve. The real question is not *if* you will make a difference, but *what* difference you will make.

Respectful, transparent, and regular face-to-face communication between leaders and their people breaks down barriers and builds trust. What you can see in a person's eyes or other body language can be revealing. While technology can be effective at times, it will never replace human contact for discovery and inspiration.

The most impactful leaders are adept listeners, and don't allow their egos to become roadblocks. When egos are alive and well, listening ceases, effective coaching environments disappear, and organizations suffer.

Here are three recommendations that can help you raise the bar on your ability to coach others.

1. Create a positive and open environment for communication

People listen to and follow leaders they trust. They engage in meaningful dialog with people they trust. They are not afraid to disagree with people they trust. Trust provides the foundation for a positive and open communication environment where connections between people can thrive.

When people connect, they learn about each other. They enable understanding of cultures, individual strengths and challenges. Knowing your people's unique capabilities and desires helps focus on how to help them be successful.

Knowing your people also reduces the probability of promoting someone into a management position who does not want it or is not otherwise qualified. Not all physicians want to be managers. Not all sales people want to be sales managers. Not all technicians want to be a shop foreman. The costs can be exorbitant to an organization that wrongly promotes someone into a management position.

There are four questions that can help establish this open line of communication: What is on your mind? What can I do for you? What do you think? How am I making your life more difficult? When asked with the genuine interest, people respond with more honesty.



A “Hall of Fame” NEA Reunion

Before there was TAUC, there was the National Erectors Association (NEA), our predecessor organization founded in 1969 (the name was changed to TAUC in 2007). For more than 30 years, the NEA served as the premier voice for contractors and created the foundation on which the modern union construction and maintenance industry was built.

Recently, an impromptu reunion of past NEA presidents took place in Minneapolis. In June 2018, friends and family gathered to celebrate the retirement of former NEA president Keiran “OB” O’Brien, founder of Danny’s Construction Company, named after his son. Along with Mr. O’Brien, four other former NEA chiefs were in attendance: Jim Mirgliotta, owner of Forest City Erectors; John “Jack” Daly, CEO of Koch Skanska, Inc; Jack Geer, past



L-R: Former NEA Presidents Jim Mirgliotta, Jack Daly, Keiran O'Brien, Jack Geer and Bill Brown

president of Tokola Corporation; and Bill Brown, Chairman Emeritus of Ben Hur Construction Company.

It is rare for so many past NEA presidents to be in the same room at one time. The photo represents decades of hard work, passion for our industry and, perhaps most impor-

tantly, an unwavering dedication to the tripartite principles upon which both TAUC and NEA were founded.

Special thanks to Keiran’s daughter Alissa Schneider, the president of Danny’s Construction, who took the photo and gave us permission to reprint it.

Meeting with your people regularly helps break down barriers. Not just in your office, but on the manufacturing floor, outside the operating room, in the cafeteria, or the warehouse. Talk to folks outside the work area like the jogging track, grocery store or the kid’s soccer game. The informal sessions can be wonderful enablers of opening the line of communication.

2. Establish agreed upon goals and strategies to achieve

Most people want to know what success looks like. They want to be clear in their goals as an individual and, if appropriate, the leader of a team. Well-defined, measurable, relevant goals on paper help people gain clarity on success for them. Assigning responsibility with authority helps inspire an individual’s commitment to be successful. Success also includes how to reach their goals. Strategies

are developed and agreed upon by the manager and team member so that both understand each other’s roles. The probability of success increases dramatically when strategies and accountabilities are well defined.

3. Enforce accountability by assessing performance

There are many and significant consequences when people are not held accountable for achieving goals or otherwise performing to standard. Integrity disappears. Discipline erodes. Morale evaporates. Leaders are not taken seriously. Problem employees become a cancer in the organization. The best people leave. Results are not achieved.

Effective coaching demands assessment of performance. Without this assessment, no system of accountability will be achieved. If the senior leader does not hold his or her

executive team accountable, subordinate leaders are likely to think “Why should I?”

Consistent, regularly scheduled coaching sessions with your people are the key to ensuring effective follow-up assessments to celebrate successes and identify areas to improve.

Summary

Coaching session agendas will vary based on a variety of conditions. A good place to start is outlined below.

First, review the individual goals and those of the organization. Ensure alignment of both to clarify where the individual is contributing to the mission of the organization.

Second, discuss what is going well. Where do both the coach and the individual agree on successes? Provide positive recognition for achievements where important.

Continued on Page 29

A Second Look at Carbon Capture Technology

Will Federal Funding & Research Kickstart a New Industry Niche?

by DAVID ACORD

JUST A FEW years ago, the notion of capturing carbon dioxide (CO₂) emitted from power plants and storing it underground – or repurposing it for other industrial uses – was considered by many in our industry to be an overly expensive, untested and risky proposition. It was one of those ideas that sounded good in theory, and looked good on paper, but probably couldn't work in the real world.

When the Obama administration in 2012 floated the idea of requiring new coal-fired power plants to use carbon capture technology to reduce emissions, it was met with fierce resistance and widely criticized as a “poison pill” that would effectively discourage utilities from adding any new coal generation to their fleets, because the costs of capture would simply be too great.

But what a difference a few years – and a few amazing technological advances – can make. Carbon capture, utilization and storage (CCUS) is now seen by many as an increasingly viable and cost-effective way to not only cut down on CO₂ emissions (see Newton Jones' informative article on Page 19) but also create an entirely new market where captured carbon is not just stored, but recycled and repurposed for a multitude of other downstream uses. This in turn could potentially lead to a wealth of new business opportunities for industrial contractors, as customers seek to install a new generation of more efficient (and affordable) CCUS technology at their power plants and manufacturing facilities.

Sound too good to be true? Perhaps, and at this stage of the game, it's wise not to be overly optimistic. But there's no denying that CCUS technology is on the upswing and has a lot of investors interested in its long-term applications.

The Basics

The U.S. Department of Energy (DOE) defines CCUS as “a process that captures carbon dioxide emissions from sources like coal-fired power plants and either reuses or



NRG Petra Nova Plant near Houston, TX

stores it so it will not enter the atmosphere. Carbon dioxide storage in geologic formations includes oil and gas reservoirs, unmineable coal seams and deep saline reservoirs -- structures that have stored crude oil, natural gas, brine and carbon dioxide over millions of years.”

DOE is investing huge amounts of federal funds into CCUS research and development. If it catches on at utilities and manufacturing plants, there are two basic types of carbon capture technology that industrial contractors would be involved in installing:

Post-combustion CO₂ capture — As the name implies, this strategy involves capturing CO₂ from the flue gas after the energy source (coal, natural gas or even oil) has been burned. As you can see from the diagram on Page 17, in this method, the CO₂ is captured at the end of the cleaning/scrubbing process, after particulate matter, sulfur

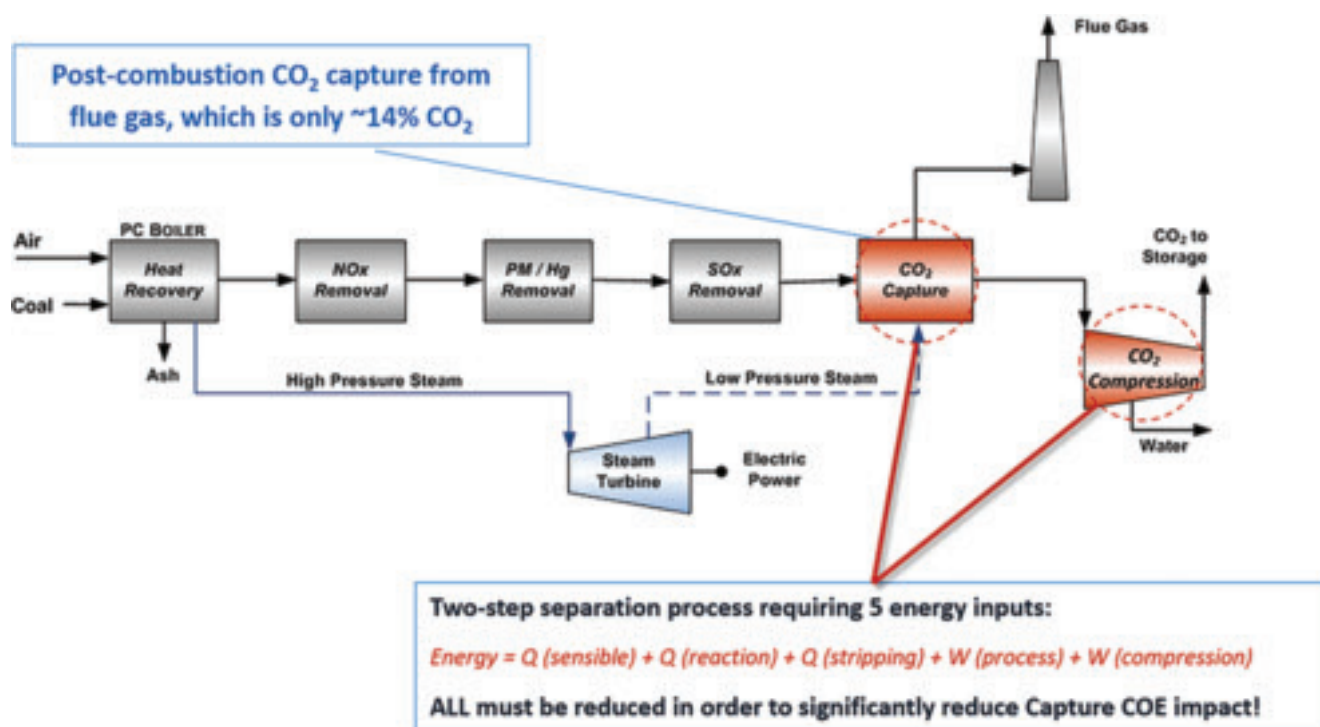
dioxide and nitrogen oxide contaminants have already been removed. It's essentially another mechanical intervention in the gas stream that would need to be put into place. After capture, the CO₂ is then compressed (more on that a little later) and either sent on to storage or rerouted for other downstream purposes via pipeline. According to DOE, currently, "The biggest challenge in post-combustion capture is separating CO₂ generated during combustion from the large amounts of nitrogen (from air) found in the flue gas."

By far the most successful and well-known post-combustion capture project is found at the coal-fired, 240-MW Petra Nova power plant southwest of Houston, Texas. A joint venture between NRG and JX Nippon, the CCUS project also received \$190 million grant from the DOE. The result: a whopping 90% decrease in the plant's CO₂ emissions. Within its first 10 months of operation, Petra Nova captured more than one million tons of CO₂. The CO₂ was then diverted and rerouted to nearby oil fields and injected into mature reservoirs to release more oil. In the same timeframe, oil production skyrocketed by more than 1,300 percent. "This process revitalizes a diminishing oil field, without involving hydraulic fracturing—creating a significantly more sustainable solution for making the most of existing oil fields," NRG said.

Pre-combustion CO₂ capture — Used primarily in combined-cycle power plants, pre-combustion technology separates CO₂ from hydrogen and other constituents in the synthesis gas (syngas) produced by coal gasification; the syngas is then used to create additional steam and electricity.

"In order to facilitate carbon capture and increase the hydrogen production, the syngas is shifted in a water-gas-shift (WGS) reaction to produce additional hydrogen and convert the carbon monoxide into carbon dioxide (CO₂)," DOE explained, giving an example of how a typical pre-capture system might work. "In this case, the carbon is captured from the shifted syngas and afterward, the remaining hydrogen (H₂) is combusted in a gas turbine that generates power."


CO₂ Compression — Regardless of which method is used to capture the carbon, once it's in hand, it has to be compressed to a pressure of anywhere between 1,500 and 2,200 psi in order to transport it via pipeline to its final destination -- either underground geologic storage or further downstream use). This isn't as easy as it sounds, though, because CO₂ separation occurs at relatively low pressure levels. In order to achieve the necessary pressure increase, compressors capable of achieving supersonic speeds often need to be installed. Another wrinkle is that if the CO₂ is

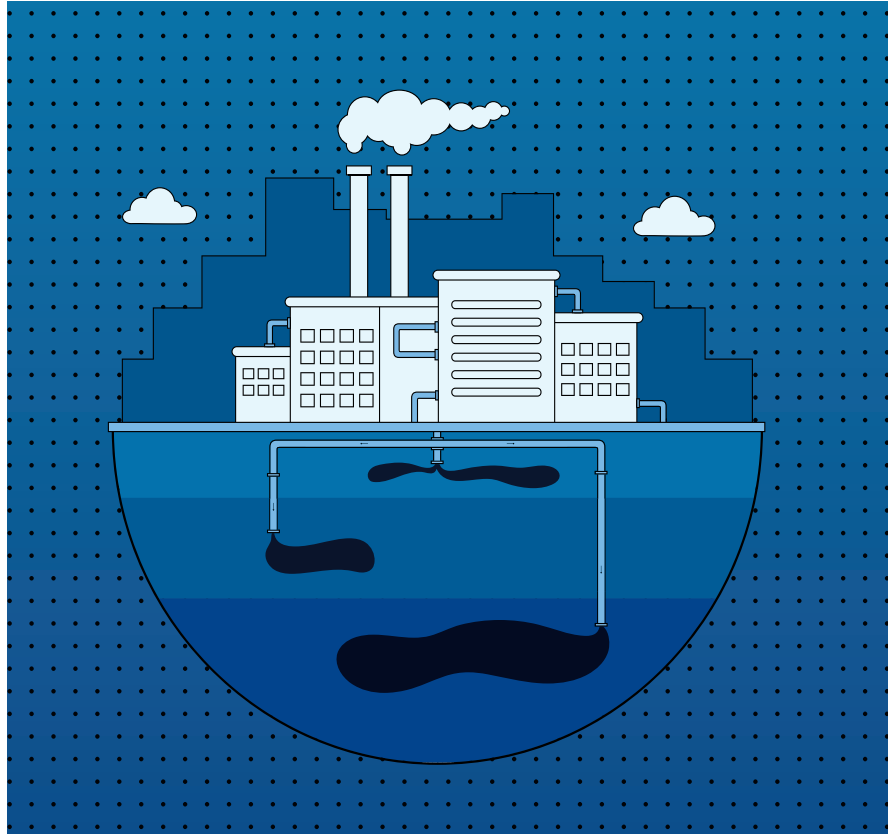


Source: U.S. Department of Energy

headed for geologic storage, the pressure must be increased to a level greater than that of the storage area, which is already under extreme compression because it's so deep underground.

"Compression of CO₂ is challenging because it represents a potentially large auxiliary power load on the overall power plant system," the DOE concedes. "For example, in an August 2007 study...CO₂ compression was accomplished using a six-stage centrifugal compressor with interstage cooling that required an auxiliary load of approximately 7.5 percent of the gross power output of a subcritical pressure, coal-fired power plant," the agency noted.

So those are the basics — and the challenges. TAUC will keep you updated on the latest CCUS developments. If — or when — the technology ushers in a new wave of business, you'll be the first to know. 



Princeton: New Carbon Capture Network Could Slash CO₂ Emissions

A pipeline network stretching across the U.S. Midwest to capture and store CO₂ could dramatically reduce carbon emissions, a group of researchers from Princeton University say in a new study.

The idea is simple: capture CO₂ from ethanol refineries in the Midwest and transport them via pipeline to oil fields in West Texas. "The captured carbon would then be pumped into near-depleted oil fields through a technique known as enhanced oil recovery, where the carbon dioxide helps recover residual oil while ultimately being trapped underground," the university said. "The researchers found that this capture-and-storage network could prevent up to 30

million metric tons of human-made carbon dioxide from entering the atmosphere each year — an amount equal to removing 6.5 million cars from the road. Currently, about 31 million metric tons of carbon dioxide annually are captured and stored worldwide."

The scientists say the pipeline network would be profitable thanks to the FUTURE Act, which was recently passed by Congress to give tax credits to encourage CCUS investment (see article next page), coupled with low-interest federal loans to build out the pipeline infrastructure.

"If governments provided low-cost loans for only half of the pipelines, the resulting smaller-scale network

would still sequester 19 million metric tons of carbon dioxide per year," the university noted.

"The new tax credits are the most significant policy incentivizing carbon capture, utilization and storage (CCUS) in the world today," said first author Ryan Edwards, who recently earned his Ph.D. in civil and environmental engineering from Princeton. "This is the first time we've had a policy in front of us that lets us seriously consider deployment on a large scale. There's a lot of interest in CCUS at different levels, and bipartisan support. What there hasn't been is a plan for how this could happen and what it would look like."

CCUS Gains Wider Acceptance as Climate Change Solution

Technology breakthroughs, renewable limitations drive shift



by **NEWTON B. JONES**

INTERNATIONAL PRESIDENT,
INTERNATIONAL
BROTHERHOOD OF
BOILERMAKERS

EDITOR'S NOTE: The following article originally appeared in the April-June 2018 issue of The Boilermaker Reporter, the official print publication of the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers. TAUC thanks the Boilermakers for permission to reprint it here.

CAPTURING AND USING carbon dioxide as a way to mitigate climate change has for decades been broadly dismissed by many climate activists, environmental groups, scientists and government officials as expensive, impractical and unnecessary.

That mindset is finally beginning to change markedly, thanks to advances in technology and the growing realization that renewables alone cannot solve the climate problem.

On May 30, Net Power reached a milestone by successfully firing up a pilot natural gas plant near Houston that captures 100 percent of its emissions during the power generation process. This feat is revolutionary and is raising eyebrows. Burning fossil fuels without emitting any CO₂ has been a holy grail for proponents of coal and natural gas. Now, at least on a pilot scale, Net Power has attained the grail, and the company is confident its technology will work at commercial scale as well.

The Net Power success follows on the heels of other carbon capture, utilization and storage (CCUS) breakthrough projects such as the NRG-JX Nippon Petra Nova coal-fired plant (also in Texas) that captures 90 percent of carbon emissions; the Shell Quest project in the oil sands region of Alberta that has captured and stored 3 million tons of CO₂ in its first three years of operations; the SaskPower plant in Saskatchewan that is the first in the world to successfully adapt carbon capture to a commercial scale coal-fired power plant; and the NWR Sturgeon Refinery project in

Alberta, the first refinery in the world designed with an integrated system to capture CO₂ produced during the refining process. (Boilermakers, by the way, played a substantial role in the last three projects listed.)

These successes and others around the world are proving that CCUS can work in commercial applications. Importantly, as these projects gain operational experience, the costs to build and run them continues to fall.

Meanwhile, technologies for using the captured carbon to create products ranging from chemicals to fertilizer to concrete blocks continue to advance as well. Research and development by industries, universities and the government offer the promise that carbon dioxide can not only be captured, stored and used for enhanced oil recovery, it can also have value as a commodity.

While CCUS technologies advance and provide real-world experience, global and regional climate organizations and experts continue raising awareness that we cannot rely solely on renewable energy technologies like wind and solar to mitigate climate change, as some in the environmental community are fond of arguing. A growing consensus from the most widely respected organizations is that CCUS is not *optional* but *essential* to reach climate goals.

In fact, the world's leading international body for assessing climate change — the United Nations Intergovernmental Panel on Climate Change (IPCC) — whose “assessment reports” are considered authoritative, has placed increasing emphasis

on CCUS. In its Fifth Assessment Report, published in 2014, the IPCC found that attempting to stabilize atmospheric CO₂ concentrations to 430-480 parts per million without carbon capture would increase global mitigation costs by 138 percent. The Sixth Assessment Report is due out this year, and we will be closely watching to see how the IPCC treats CCUS four years later.

Another highly respected climate organization, the International Energy Agency, also recognizes the critical role CCUS must play. In its 2016 report titled “20 Years of Carbon Capture and Storage,” the IEA urged greater financial incentives to accelerate carbon capture and storage as a mitigation solution.

That is something the Boilermakers have long argued for as well, and we were pleased to report in the previous issue of the Reporter that a bill offering robust incentives for CCUS has become law. Known as the FUTURE Act, the bill enjoyed broad bipartisan support. It was sponsored by North Dakota Senator Heidi Heitkamp (our 2018 Senate Legislator of the Year) and others. The FUTURE Act, for the first time, puts substantial federal tax credits (as much as \$50 a metric ton) in the hands of power plants and heavy industry facilities that capture and store CO₂. Finally, there is a financial incentive large enough to drive innovation and investment. By some estimates, the Act will trigger \$1 billion in investments beyond what industry was already planning.

A particular aspect of the FUTURE Act that should draw special attention is that tax credits are also available for “direct air capture” of CO₂. This means a system designed not to remove CO₂ from an industrial process or a car engine’s exhaust but from the very air around us. If developed and deployed successfully, direct air capture could be another game changer. While the technology is in its infancy, several firms are proving the concept’s feasibility,

“A growing consensus from the most widely respected organizations is that CCUS is not optional but essential to reach climate goals.”

including Switzerland’s Climeworks, Canada’s Carbon Engineering and a Finish-German consortium known as Soletair. While direct air capture has its naysayers, Climeworks, has said its goal is to capture 1 percent of global CO₂ emissions by 2025, according to a BBC report: “Climate’s magic rabbit: Pulling CO₂ out of thin air.”

The bipartisan nature of the FUTURE Act is especially important. It indicates that support for CCUS may be transcending political positions that have aligned with extreme environmentalists. We will need strong bipartisanship going forward if we are to elevate investments in climate change solutions by the order of magnitude necessary.

“Big Steps and Big Strides” Are Not Enough

Although the developments cited above are encouraging, the pace of change needs to quicken exponentially if we are to prevent global temperature rise from reaching the 2 degree Centigrade threshold that some say is the limit beyond which catastrophic climate change will result.

It’s an enormous challenge.


Recently, during Boilermaker-sponsored interviews of some of the world’s experts on CCUS, Carbon Wrangler CEO Julio Friedmann (a former Principal Deputy Assistant Secretary for Fossil Energy with the Department of Energy) described

just how big the challenge is. [See Friedmann’s interview and those of other CCUS experts in a video produced by the Boilermakers at <http://CleanerFutureCCS.org>.]

“If you embrace climate science, you’ve got to embrace climate math — and climate math is harsh and it’s unforgiving and it’s daunting,” he said. “Right now, we emit 54 billion tons of CO₂ every year. That is 100 times the weight of all the human beings in the world.

“So we’ve got to take big steps and big strides, and we have made big steps and big strides on efficiency and in power [generation] on a handful of stuff. But we are nowhere close. Critically, we can’t win slowly; winning slowly is the same as losing the climate. We have to get to zero super-fast, and we have to get to negative [emissions] beyond that. And carbon capture and storage is . . . part of what you need to get the job done.”

Friedmann is absolutely right, the climate math is daunting. But we are at last seeing the technology advances and the public policy changes that are essential to moving CCUS forward. Those changes should help accelerate the research and development, testing, and deployment of a broad range of effective mitigation technologies.

From there, we will need to rapidly scale up deployment — and that will require not only a wider acceptance of these technologies but an enormous investment. If the global community is truly serious about coming to terms with climate change, that investment needs to be made, and soon. 



The State of Construction Technology

Continued from Page 10

5. Construction wages are continuing to rise, and quickly. Up 4.5 percent in the last year (compared to +2.2 percent across all industries), and 31.2 percent over January 2007. **Bottom line:** Labor wages are at a premium

The huge bump in ConTech investment and venture capital is hopeful proof of an impending surge of technology and hardware marvels promising to optimize the industry. Many in Silicon Valley are betting that ConTech can solve the woes currently plaguing the trade through a handful of creative approaches.

How do startups fit in?

The problem: Construction schedules are expanding and labor and materials costs are rising sharply.

The solution: ConTech startups promise to deliver projects faster, with fewer resources and cheaper than ever before.

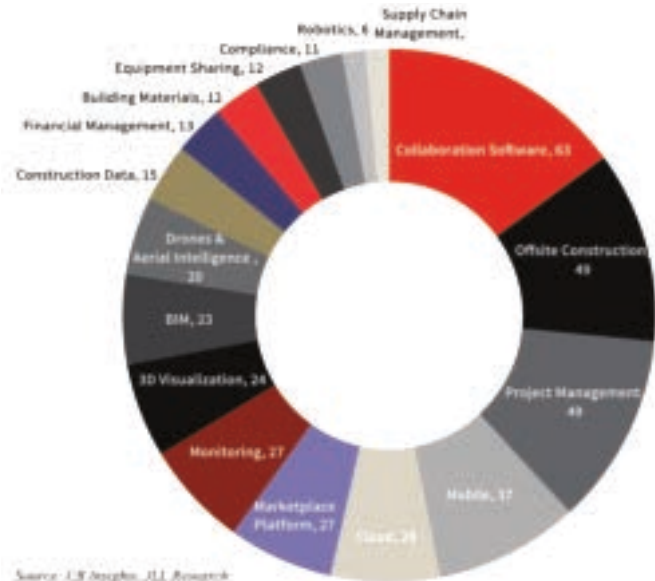
ConTech Startup Focus #1: Collaboration Software

In today's construction environment, dozens of professionals can be working on a given construction project simultaneously—sharing documents, providing edits and making on-the-ground decisions. Architects, engineers, project managers, general contractors, cost estimators, clients and many others all work from a common schematic. To combat version control and speed up the paper-passing process, a sizeable chunk of construction tech startups are focused on optimizing that workflow. Front-runners are utilizing cloud capabilities, mobile platforms and dedicated design software that allow for plans and markups to be shared instantaneously with all project stakeholders.

Leaders: Procore Technologies (TAUC Legacy Partner) - \$180.2M in funding; PlanGrid - \$66.0M; Flux Factory - \$39.3M

“Construction is one of the least digitized industries in the world,” said Adrian Fortino, managing director of Mercury Fund, a startup venture capital firm. “In spite of the existence of large venture backed companies like PlanGrid and Procore, venture capital investors still believe that there are a number of large companies to be built given the size of the market and lack of automation throughout construction workflows. We think workflow connectivity is one of the most interesting opportunities.”

Where Construction Technology startups are innovating
(by number of startups in category)



ConTech Startup Focus #2: Offsite Construction

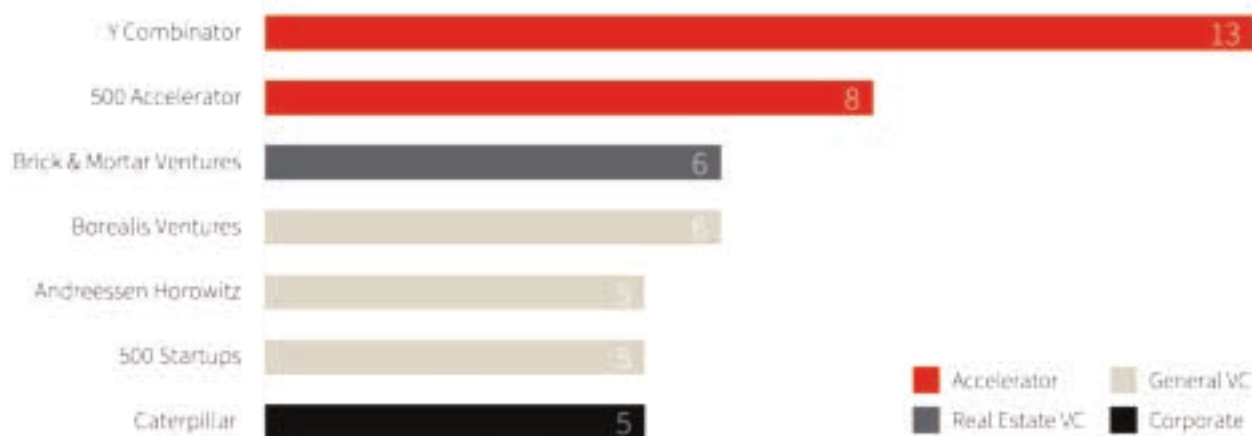
As skilled construction labor becomes harder to find, materials continue to rise in price, and general competition for construction inputs heats up—offsite construction startups are championing a different approach to how buildings are built. Offsite startups are focused on fabricating building components in a manufacturing setting, then shipping the pieces to the final building location for rapid assembly. Offsite construction can be leveraged for nearly every property type, and it utilizes intense supply chain optimization and just-in-time delivery to quickly and economically construct buildings.

Leaders: Katerra - \$1.1B in funding; Blu Homes - \$179.5M; Project Frog - \$93.0M

ConTech Startup Focus #3: Big Data and Artificial Intelligence

Today, by way of the internet of things (IoT), beacon technology and smart software, nearly every aspect of a construction site and project can collect data. Startups that leverage big data and artificial intelligence (AI) are aiming to utilize these massive data sets as a tool to make more informed decisions on a construction site. Successful startups cover a range of solutions; from optimizing materials deliveries and worker placement on site, to preemptively

Most active Construction Technology investors (by number of Construction Technology startups in portfolio)



Source: CB Insights, JLL Research

predicting equipment maintenance and automating simple business processes. As data tracking becomes more prevalent in the construction industry, these startups will be wading through massive pools of numbers and offering insights into better workflows.

Leaders: Uptake Technologies - \$287M in funding; Flux Factory - \$39.1M; SmartEquip - \$31.6M

Top Startups and Investors

The top startups in 2017 and 2018 by funding are focused on modernizing and streamlining the lagging construction industry. Offsite construction, cloud-based software and new tech-focused hardware are capturing the largest investor dollars and customer bases. Artificial intelligence and big data solutions are a close second but are positioned to make even larger impacts. Here is a quick look at three of the top startups:

Katerra, Menlo Park, CA. Founded 2015. The star child of 2017 Construction Technology VC, Katerra is an integrated technology, construction and development company focused on building assets quicker and cheaper. Utilizing BIM technologies, a global supply chain, prefab construction and manufacturing techniques, and just-in-time delivery of ready-to-install components, Katerra is redefining how modern construction is done.

Uptake, Chicago, IL. Founded 2014. Uptake creates predictive analytics software that collects and interprets sensor data for mining, rail, energy, aviation, retail and construction industries. The company integrates industry expertise, data science and workflow connectivity to build solutions based on massive data sets, identify problems before they happen, and drive safety, efficiency and productivity.

Procore, Santa Barbara, CA. Founded 2002. Procore Technologies creates and sells a suite of cloud-based construction management software, focusing on optimized workflow and information sharing. The Procore product family covers all types of construction projects and roles within the construction life cycle.

About JLL Research

JLL's research team delivers intelligence, analysis and insight through market-leading reports and services that illuminate today's commercial real estate dynamics and identify tomorrow's challenges and opportunities. Our more than 400 global research professionals track and analyze economic and property trends and forecast future conditions in over 60 countries, producing unrivalled local and global perspectives. Our research and expertise, fueled by real-time information and innovative thinking around the world, creates a competitive advantage for our clients and drives successful strategies and optimal real estate decisions.

Who Will End Up Paying?

by STEVE FELLMAN, TAUC GENERAL COUNSEL

WHEN PRESIDENT TRUMP campaigned for office, he promised that if elected, his administration would promote economic growth by curtailing new government regulations and eliminating many existing ones. He also promised to promote the export of American products by renegotiating international trade agreements that gave our trading partners unfair advantages. But as it turns out, achieving these goals – which are supported by many in the construction industry – won't be as simple, or as painless, as we would like to think.

The Cost of Deregulation

The President has been faced with Congressional gridlock that has made it extremely difficult to pass any legislation. One example is the failure of Congress to implement desperately needed multiemployer pension reform legislation, even though a coalition of leading construction trade unions and union contractor associations led by TAUC have proposed a reasonable fix. Unfunded pension liability hangs like a sword over the head of the union construction industry.

Faced with inaction on Capitol Hill, President Trump has directed the members of his cabinet to adopt policies within their respective agencies to advance his strategies for promoting economic growth. The Administration has not only cut regulatory programs and eliminated a swath of new regulations (except for immigration restrictions), but it has also cut entitlement programs that enabled the states to provide services to low-income residents and schools.

The result has been significant litigation, with states challenging the President's right to take such actions. Prior to President Trump's election,



most states had enacted regulations and entitlement programs based on federal government enforcement and funding. When the feds bowed out, many states were left holding the bag. Portions of educational and health-care programs were suddenly out of money. In addition, many environmental controls have been lifted and worker safety enforcement has been curtailed. Many states are already operating with budget deficits and do not want to increase borrowing. Elected state officials are afraid to raise state income or sales taxes as voters are already complaining about high tax rates. At the same time, states don't want to place across-the-board new taxes on businesses, fearing it would cause them to leave.

Many business owners are also complaining. Although corporate tax rates have gone down, new U.S. trade policies and the institution of new and higher U.S. tariff rates have raised the costs of many raw materials such as specialty steels, which are not manufactured in the U.S. and are needed in

many industries such as construction. Faced with higher U.S. tariffs foreign countries have retaliated by creating more tariffs on U.S. goods.

New Concerns

So what does all of this mean for contractors? You can expect that many state and counties will look at adopting user taxes as ways of increasing revenues to help pay for lost federal funds. User taxes for construction companies could be in the form of more expensive permitting procedures, licensing fees, inspection fees, etc. These user fees would increase the costs of doing business.

At the same time as costs for raw materials are rising and increased user fees are on the horizon, contractors are facing a labor shortage. Although the federal government is emphasizing that the U.S. national employment rate has reached a new high, in the construction industry,

Continued on Page 30

Recruiting on Difference

by JACOB SNYDER

WHAT MAKES US DIFFERENT? When it comes to organizations (or in our case, the union construction and maintenance industry), this is an important question. We need to answer it so that we can identify the “secret sauce,” if you will – the reason why clients should choose us over our non-union competitors. Organizations that can find their differentiators or competitive advantage in the marketplace are often the organizations that see great success. In fact, Theodore Levitt writes in his book *The Marketing Imagination*, “Differentiation is one of the most important strategic and tactical activities in which companies must constantly engage.”

Perhaps the biggest reason this is so important and so relevant right now for our industry is the fact that we face a substantial skilled workforce shortage. We need to identify and then share our differentiators with potential recruits (and customers) to attract both a new generation of workers as well as new work opportunities.

The Indeed Hiring Lab’s most recent JOLTS report (which outlines the number of open jobs in an industry per available job seeker) showed that construction has the highest ratio at 1.81:1. This means there are almost two open positions for every available person in the field. Further, we are not only competing with other construction groups. The job market in general is hot -- so hot, in fact, roughly 2.4% of the workforce quits their current job each month, the highest rate since 2001, according to the most recent data available through the Indeed Hiring Lab. Further, we are losing Baby Boomers at an alarming rate; across all industries, roughly 10,000 Baby Boomers retire from the workforce every day.

So, as we face this challenge of retaining and recruiting limited labor resources, our messaging becomes absolutely critical. What can we sell to prospective workers? Why are we better? The non-union sector has the opportunity edge. They control the majority of the market share and often pay more on the check, especially when you factor in per diem. So why should someone want to work for us?

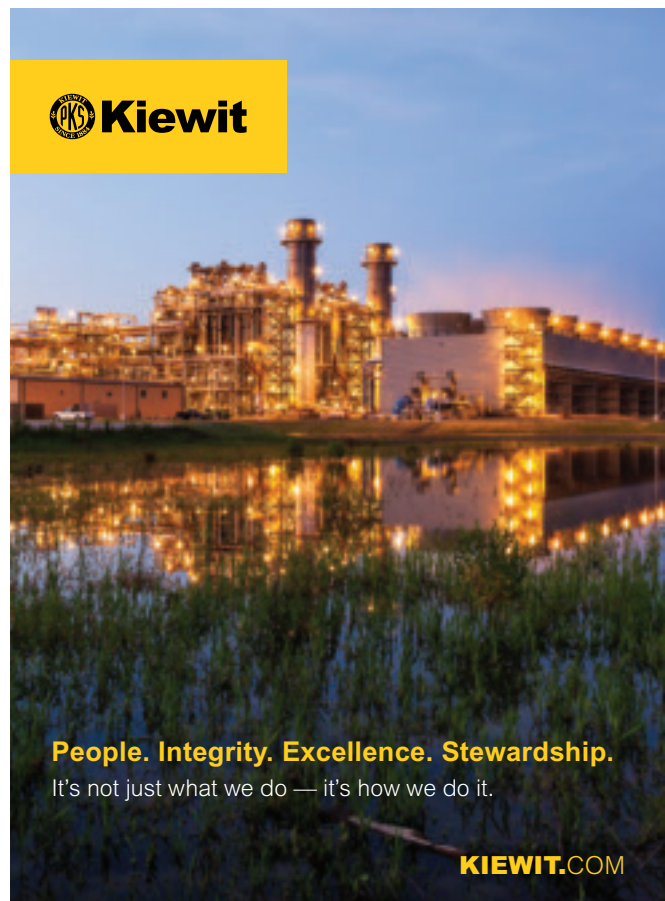
Our customers recognize the issues the industry is facing and are actively looking for solutions to maintain and build the facilities and projects. Being able to effectively and honestly answer the “people” question is paramount to a contractor’s success and is a significant differentiator in the current market.

So, first we need to identify our differentiators. For the purposes of this discussion we will take wages out of the discussion. If wages are the same, what makes us attractive to talent?



First, we have a story to tell about community involvement and purpose.

Construction labor unions and their contractors are famous for their involvement in the communities they serve, but they are only famous with those who already know them. Further, there is purpose in our business in building our country, making it better, providing good quality careers...and the list goes on. As we seek



"Union construction is about more than just jobs, it's about opportunities, improving our communities and advancing our country."

new workers into the industry, especially younger workers, giving them a sense of greater purpose is important. According to a recent Deloitte study, six in 10 millennials said a sense of purpose was a major factor in deciding on their current job. Union construction is about more than just jobs, it's about opportunities, improving our communities and advancing our country.


Second, we have a story to tell about training, careers and advancement.

The story for young workers is not about learning a trade and that aspect of training. For young workers, training is about growth and advancement. Our industry fails to tell the story of the journey from an apprentice to foreman to general foreman to superintendent to project manager to vice president to president. I know no other industry that allows for such a clear line to the top for those who start at the entry level. And focusing the training and career message is important because according to Pew Research, Millennials already make up 35% of the workforce and the

number is growing. We also have the ability to sell that our training is free amidst the amount of college loan debt so many younger workers are taking on.

The third area I want to talk about is one that is not a current differentiator, but I believe can be with the right effort, especially given the training infrastructure we have to support it.

Technology is an area that construction has historically been slow to adopt. Construction is often high-risk, lower-margin work involving seasonal workers, so investments in technology are not made as often as in other businesses. However, with a shared union workforce and training infrastructure, we can change that. One of the major attractions for younger workers is the use and integration of new technology and equipment.

I am sure we have other differentiators, especially in specific markets and industries. But regardless of what they are, finding and marketing our career differentiators can be a valuable tool in recruiting the next generation of craftspeople, which we badly need. 



Jacob Snyder is the TAUC Industrial Relations Committee Chairman and Director of Safety and Labor Relations for Enerfab Power & Industrial, Inc.

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NATIONAL MAINTENANCE AGREEMENTS POLICY COMMITTEE, INC.

The Pace of Change

by SCOTT FISHER

RECENTLY I'VE BEEN reflecting on the incredible changes taking place within the union construction and maintenance industry. The first week in October will mark my fifty-third year in the construction industry. Just the thought of fifty-plus years causes me to look back on the days when I was starting out as an apprentice Carpenter. I wonder if young apprentices today can imagine how different things were back then. Here are a couple of examples of how dramatically the jobsite has changed for the better in a few short decades.

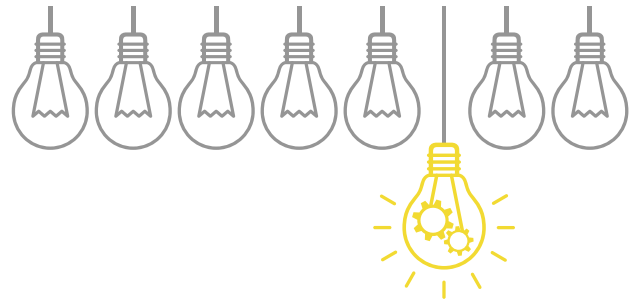
I started my apprenticeship building custom homes and apartment buildings for a local contractor. While working with a couple of crusty “old” journeymen (I say that with all due respect) that had to be in their early thirties, I was introduced to a new product that my fellow carpenters said would never work and be short-lived in the housing market: “pre-engineered roof trusses.”

Shortly after my introduction to roof trusses, my partner and I were preparing to place the ply-wood on the roof of my third house when we were approached by a guy selling a new tool that he claimed every framing crew should have. He called it a “power nail gun.” Now, this salesman was really giving us the pitch, and although we had no authority to make a purchase of this magnitude, my partner threw down the ultimate challenge to the salesman: if he could nail down the plywood on the street side of the roof faster than my partner and I could nail down the back half of the roof, we would buy a power nail gun from him.

We beat him by one piece of plywood. As we lay on the ground panting and trying to catch our breath from exhaustion, my partner looked at me and said, “The boss needs to get a couple of those guns.”

Of course, pre-engineered roof trusses and power nail-guns of all makes and models are now commonplace in the industry.


I was reminded of these episodes this past August when TAUC held its summer committee meetings at DEWALT headquarters in Towson, Maryland, just outside of Baltimore. DEWALT – TAUC’s very first Legacy Partner – was generous enough to turn over their conference center to us for our business meetings. However, after our meetings, they went a step further. DEWALT representatives gave us a tour of their design and manufacturing facilities. We were able to get a rare, behind-the-scenes look at how the company is designing, testing and manufacturing the next generation of high-tech tools. In my fifty years I’ve seen hundreds and hundreds of innovations that have made our jobs easier, and safer.



However, the pace of change in our industry is quickly approaching light speed!

The folks at DEWALT are focused like a laser beam on creating products that help workers do their jobs more safely and efficiently than ever before. They are constantly asking, “What can we do to make things better? What’s a problem you have on the job that you’d like to see a solution for?” Then they go back to their drafting tables and start working. The search for “better” never ends. And the cooperative spirit between the manufacturer and the boots-on-the-ground workers is phenomenal.

I have to admit that after the tour, I found myself feeling a little jealous of the young people that are just entering our industry. What I wouldn’t give to have had some of these tools back when I was starting out! I hope they feel the same sense of wonder and potential I felt when I was first introduced to those trusses and that nail-gun. I hope older folks like us take the time to help them understand the proper ways to use these powerful tools – and I also hope we don’t leave the “new-fangled stuff” for the younger kids to figure out. Even veterans like myself need to keep up-to-date on the “latest and greatest” innovations.

I don’t know about you, but given the amazing leaps in technology, coupled with the high-quality training our industry’s apprenticeship programs offer, I can’t wait to see what this next generation of professionals is able to accomplish. 



Scott Fisher is the TAUC LEO Committee Chair and Vice President of Labor Relations, Safety & Health and Workforce Development for the Associated General Contractors (AGC) of Michigan.

TAUC Fights to Fund Job Training the Right Way

by JIM KOLB, PARTNER, SUMMIT STRATEGIES GOVERNMENT AFFAIRS LLC

THE CURRENT HYPER-POLITICAL environment in Washington has made it hard for Congress to agree on much of anything. In partisan infighting. One of the few issues that appears to be breaking through the partisan infighting and gridlock is the need to expand workforce development and training opportunities. Shortages of skilled workers and the desire to provide pathways to well-paying jobs and economic security have united the right and the left, Republicans and Democrats, and business and labor. While everyone agrees we need to expand training opportunities, the devil will be in the details of the policies that come forward. How policy-makers choose to address these concerns will be critical for the union construction industry.

TAUC and its industry partners have been actively engaged in these policy discussions, communicating that any effort to expand training opportunities or to change current registered apprenticeship training programs must not negatively impact the unionized construction industry.

For over 100 years, construction contractors have partnered with building trade unions to provide privately funded, world-class apprenticeship and training opportunities. TAUC members and other union construction associations jointly operate with their labor partners over 1,100 training centers nationwide, making private investments of approximately \$1.3 billion annually in registered apprenticeship programs, which do not rely on taxpayer dollars.


The union men and women TAUC members employ are among the most well-trained and highly skilled construction industry professionals in the world. They ensure we can provide the safest, highest-quality construction services to our customers. These workers attain their high levels of proficiency by participating in rigorous joint labor-management registered apprenticeship programs *paid for by signatory contractors*.

The significant investments TAUC members make in the workforce also ensures the long-term viability and growth of the construction industry. These joint training programs are constantly being upgraded to provide the flexibility to ensure that construction professions have access to cutting-edge technology showcased earlier this year at TAUC's first-ever Industrial Grade Innovation Conference & Expo in Dearborn, Michigan (see Summer issue, Pg. 16).

There have been calls from various trade associations and members of Congress from both sides of the aisle to provide federal subsidies and/or grants for workforce training. There have also been proposals to "modernize" workforce development by allowing new training programs that operate outside of the current registered apprenticeship system. TAUC and its partners have been very clear with policy-makers that these actions should not involve using federal tax dollars to subsidize contractors who make little or no investment in their workforce. Policy changes to modernize and expand training opportunities should build on the construction industry's existing privately funded, joint labor-management apprenticeship and training system, not actively undercut union contractors by subsidizing contractors who don't have any "skin in the game."

One proposal that could significantly benefit union construction industry training programs is the "Helping America Re-Develop High-Quality Accessible Training Act" (the "HARD HAT Act"). This legislation, introduced by Congressman Anthony Brown (D-MD), would recognize construction contractors that are investing in the future of the construction industry through investments in registered apprenticeship programs in the awarding of federal construction contracts.

Congressmen Donald Norcross (D-NJ) and David McKinley (R-WV) – the co-chairs of the Congressional Building Trades Caucus -- have also introduced legislation to expand pre-apprenticeship programs. The bipartisan "Pre-Apprenticeships To Hardhats (PATH) Act" would provide grants to assist nonprofit partnership, including joint labor management training programs, create and operate programs to provide work readiness skills. There are also proposals to allow 529 saving plans for apprenticeship costs. These types of proposals will expand training opportunities and reward contractors who invest in their workforce.

TAUC is committed to advocating for legislation — like the PATH Act and the HARD HAT Act — that will strengthen the registered apprenticeship programs. We will continue to fight efforts by Congress and the Administration to implement policies that undermine joint labor management training programs by rewarding contractors who fail to invest in their workforces' training. Federal legislation and policies should encourage employers to make investments in workforce development to deliver the highest quality work, support construction quality, and the development of a skilled workforce. 

Leading Edge vs. Sharp Edge: Do You Know the Difference?

by RUSTY BROWN, CSP

RECENTLY IN THE construction industry, there has been a tremendous amount of confusion regarding “leading edge” and “sharp edge.” This article will elaborate on these two separate concepts, explaining what each one means and pointing out the differences. Of course, one commonality is that products designed for either leading edge or sharp edge applications must meet the standards laid out in ANSI Z359.14.

“Leading edge” means the product may be tied off at the worker’s foot level, but it must meet the OSHA variance of falling further than 6’ (maximum 12’) and reduce the impact forces of the worker to less than the allowable 1,800 pounds. Importantly, the term “leading edge” has nothing

to do with whether the product will cut or break.

“Sharp edge,” on the other hand, means the lanyard or retractable can cross a metal or concrete edge greater than or equal to .005” and will not cut or break. A simpler way to explain this to workers would be a metal or concrete edge sharper than the radius of a pencil.

Why do Self Retracting Lifelines (SRLs) sometimes fail in leading edge and sharp edge scenarios? With a lanyard tied off at foot level, there will be increased forces due to fall distance. Web materials are not typically as cut-resistant as cable. With a non-leading-edge cable SRL, the shock absorber that is built into the housing is less effective when the edge becomes the new anchor point. If the work is being completed on an angle


from perpendicular and the employee falls over the edge, the cable will swing back to perpendicular causing the edge to act as a knife cutting the cable.

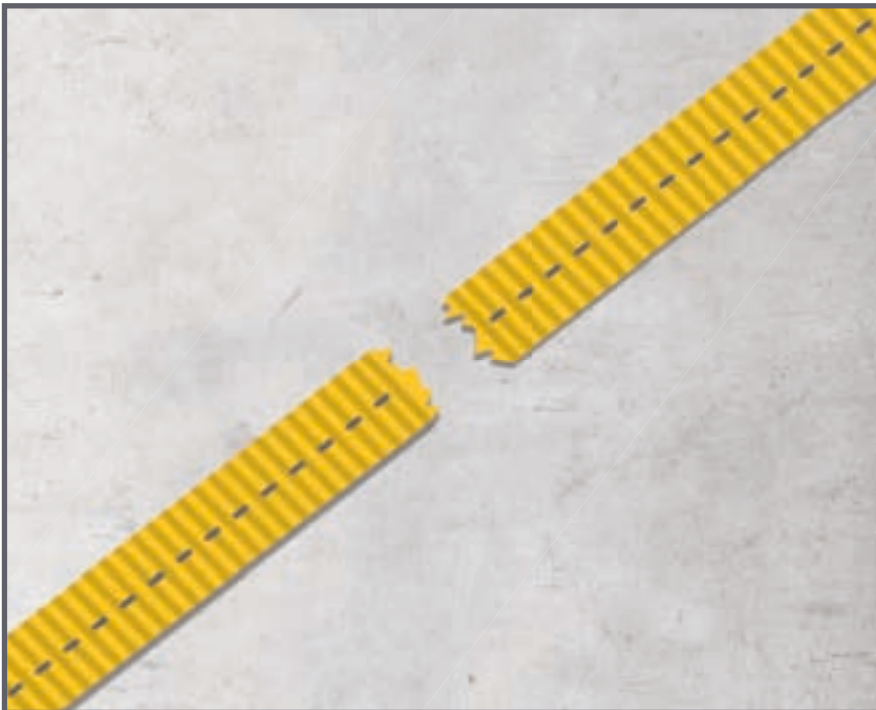
One safety provider’s solution to clearing up the confusion between leading edge and sharp edge has been to place a symbol on the SRL housing along with an additional shock absorber. This lets the worker know whether the product is leading edge or sharp edge, and also that it meets ANSI Z359.14. This provider also makes SRLs with varying cable strengths and shock pack combinations for different on-the-job scenarios.

In addition, it is always important to consult the specific clearance chart for the SRL being used. If you don’t have enough clearance, increase the setback distance from the edge.

In summary:

- Ensure product meets ANSI Z359.14
- Understand the difference between Leading Edge and Sharp Edge.
- Consult the specific clearance chart for the SRL being used.

Until next time, stay safe. 



Rusty Brown is the Environmental Health and Safety Director for Kiewit Power Constructors Co. and Chair of the TAUC Environmental Health and Safety Committee.

2. PURPOSE: A sense of purpose is now often cited as the number one priority for young talent, particularly as it relates to retention. Purpose sounds like this:


- Do I understand the real mission of the company and how I fit in?
- Does the work I do matter? And how do I know that?
- Are the plans and direction of our organization communicated to me effectively?
- Am I given the freedom and autonomy to create the best outcomes?
- Am I listened to?

Purpose now vs. purpose before? As a Boomer, my purpose was pretty damn simple: WORK HARD, GET AHEAD. Now people want and expect more, and most importantly, they can get it – if not from you, then from someone else. Another question worth asking is if the “union construction field experience” is one that promotes a positive culture and purpose. In my view, a serious upgrade is needed in this regard, with senior leaders driving this change.

Of all the things I do as a CEO, with hundreds of member companies and dozens of staff, two interrelated roles make all the difference. One is my role as Talent Picker and the other is Culture Creator & Protector. With the amount of attention paid to talent selection, the reputation of my employees is one of being “A” Players. Not every role, every year, all the time, but on balance for a small business, I hire talent for culture and fit — not skills. If I want a superstar, then I have to know they will thrive within the culture; one focused on purpose and growth. It is no mistake that a good number of our “alumni” have gone on to CEO, SVP and other top jobs around the nation. We get ‘em. We grow ‘em. And they jump out of the nest with our encouragement. But for them to thrive, the culture is

the platform for talent development and retention.

You note that I wrote not only *Culture Creator* but also *Protector*. That’s because it’s not enough to just set up the culture and expect it to thrive and support the best behaviors, growth and outcomes. No. Because people will always test it. People will bring habits from previous employment. People will fill in the blanks if you don’t have a firm framework and they will often be outside the lines. Senior management owns culture and must protect it with all they got. That’s it.

So in a hot talent market, or in an industry of unlimited upward mobility, these are the two starting places for your strategy—Culture and Purpose. The next time someone comes to you and says they got “a better offer,” put aside the money issue and ask yourself honestly if you have put enough effort into these leadership priorities. Culture and purpose are the anchors, and money is often just the excuse. What they don’t want to tell you is that you failed. Try not to get pissed at them until you have engaged in leadership self-reflection. It will be worth the time and effort; and not just now, but in your business and market strategy long-term. 




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One-on-One Coaching
Continued from Page 15

Third, discuss the challenges or areas for improvement. Underwrite honest mistakes in the pursuit of excellence so people can learn. Determine how you as the manager can help. Gain a clear understanding

of the shortfall in the individual’s ability and desire to achieve the goal and what resources or assistance the individual needs to be successful. When unsatisfactory performance occurs, managers must address it. Leaders who never take action to remove an underperformer are doing a great disservice to their institution. All too often, good people serving in leadership positions fear the task of confrontation. They hope, magically, that something will happen which will turn the underperformer around and all will be well in the end. Hope is not a strategy; the magic seldom happens. Your goal as a leader and coach is to inspire a willingness to succeed. When coaching, it is often easier to criticize and find fault. Think before you speak—find ways to praise.

Fourth, as the manager, seek suggestions for how you can be a more effective leader for them. This question can change the dynamic of the coaching session and can provide powerful feedback for the manager in his or her quest to be the best they can be. Doing so will enhance their trust in you and help build confidence in their own capabilities.

Remember, effective one-on-one coaching can be the catalyst for attracting and retaining the best people, and that will ultimately help your organization to unprecedented results. 

About the Author



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retired as a Brigadier General having served thirty-two years in the Army. Drawing on his unique military experience, Jeff uses his singular insight to build better leaders. For more information on Jeff Foley, visit www.loralmountain.com.

multiple surveys (including TAUC's own Labor Supply Survey) have found that in many areas of the country, there are severe shortages of skilled construction workers.


Possible Solutions

Luckily, there are some silver linings in all of these clouds. The challenges raised by conflicts between the federal and state governments, coupled with the lack of bipartisan leadership in Congress, are often frustrating and hard to understand, but must be recognized for what they are. A Congressional joint select committee is required by law to come up with potential solutions to the multiemployer pension funding problem no later than November 30. Hopefully this will break – or at least loosen – the gridlock on Capitol Hill, at least as it relates to multiemployer pensions, and lead to real legislative change.

The need for a strong and wide-ranging federal infrastructure program may also encourage bipartisanship. Infrastructure investment is popular on both sides of the aisle, and in both parties. Nothing will happen before the 2018 midterms, but 2020 is right around the corner, and politicians will be motivated to improve their own reelection prospects by “bringing home the bacon” in terms of big road and bridge projects. This could result in a big business boost for the union construction industry, though finding enough workers to complete the jobs will still be a challenge.

But there are encouraging signs there, too. At the recent TAUC Industrial Grade Innovation Conference and Expo, contractors, owners and unions were exposed to exciting examples of how new technology will create new opportunities by increasing productivity for existing workers and lowering job costs.

Virtual reality will make it much easier to “tour” a jobsite without leaving your office chair, and “bionic” exoskeletons will help older workers carry greater loads and get more done without risking safety or injury. This increased efficiency will help mitigate, at least in part, the problem of not finding enough qualified workers.

Hopefully, application of common sense, coupled with implementation of new technology and bipartisan action on pensions and infrastructure, will enable our industry to continue to grow – and weather the unexpected storms that accompany the President's efforts to remake our economy. 



Steve Fellman is a shareholder with GKG Law in Washington, D.C. He is also general counsel to The Association of Union Constructors.

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