SEPTEMBER/OCTOBER 2015

ENGINEERING INC.

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>> Innovations to Ease the Impact of **Drought**

>> Avoiding **Corruption** in International Markets

>> Cardno Encourages Science Careers for **Women**

>> Congress Close to **Transportation** Deal

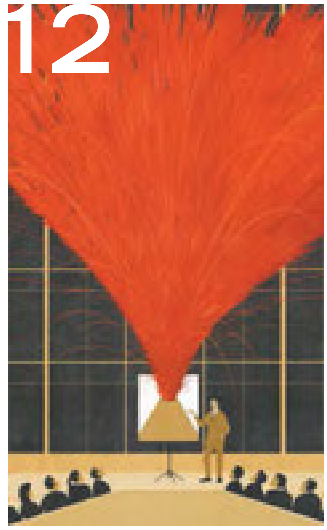
DEEP DIVE WITH ROBERT BALLARD

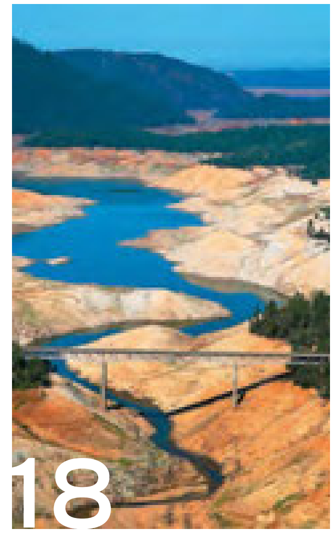
Distinguished Award of Merit Honoree

ACEC
American Council of Engineering Companies
100 Years of Excellence

ENGINEERING INC.
SEPTEMBER/OCTOBER 2015 • Vol. 26, No. 5

PROVIDED BY DR. ROBERT BALLARD





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COVER PHOTO: PROVIDED BY DR. ROBERT BALLARD

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Engineering Inc. promotes the advocacy and business interests of ACEC by offering news, legislative analysis and business practice information to member firms, clients, opinion leaders and policy makers.

From ACEC to You

Keeping Congressional Feet to the Fire On Transportation, Energy and Tax

As you read this, Congress has just returned from its summer recess and will now seek to achieve something over the next six weeks that it hasn't achieved in six years—agree on a satisfactory way to pay for a long-term transportation bill and get it to the President's desk.

Meanwhile, the clock continues to tick on the short-term extension that's set to expire October 29. And overall government funding and raising the debt limit are also up for grabs in October.

ACEC Members have written hundreds of letters to lawmakers during the recess, and ACEC-supported radio advertisements and social media campaigns have flooded key congressional districts—all part of a coordinated, multi-industry effort to get Congress off the dime, not only for transportation, but also for energy and regulatory issues and tax reform, as discussed in Legislative Action beginning on page 6.

Our September/October issue of *Engineering Inc.* also features an exceptional interview with legendary oceanographer, Dr. Robert Ballard (See page 8), to whom we will present our Distinguished Award of Merit—the Council's highest award bestowed upon an individual—at our upcoming Fall Conference in Boston. (See page 42).

Conference speakers also include Pulitzer Prize-winning author Doris Kearns Goodwin, several leading industry CEOs, a wide range of subject matter experts, and 35 roundtables and business management seminars that will address bottom-line issues for CEOs, CIOs, CFOs, and other industry professionals and emerging leaders.

This fall promises to be an important and exciting time for ACEC members both politically and professionally. We appreciate your continuing contributions to our industry and look forward to seeing you in Boston.

Ralph W. Christie, Jr.
ACEC Chairman

David A. Raymond
ACEC President & CEO

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BY GERRY DONOHUE

Mining Sector Seeks Daylight

A defining characteristic of the mining sector has long been the high volatility of commodity prices. To succeed, engineering firms serving mining clients had to figure out how to balance their operations through often tumultuous market cycles.

In the past few years, the mining industry has slogged through a prolonged slump, and commodity prices have stabilized at historic lows.

"People are no longer thinking about the cyclicality of commodity prices," says Hiran Bhadra, the national lead for KPMG's mining sector practice. "They're wondering how to adopt a different operating model for a low-price regime that may last for a long time."

One of those adaptations has been to cut back on the development and opening of new mines, which has hit engineering firms hard. Though engineers serve their clients in all phases of a mine's life cycle, from geological exploration to mine closure, the bulk of their work is in the early stages.

"We're project-focused," says Duane Gingrich, president of mining and metals in the Americas at Amec Foster Wheeler. "We do some work in existing operations, but the majority of our work is in developing new projects. So when that slows, we feel it."

Supply and Demand

The sluggish mining market has a few more years to run, according to BMI Research, which forecasts just 1.9 percent annual growth through 2019.

Three factors are holding the market back.

Primarily, the slowdown of two of the world's largest economies—China and Europe—has reduced demand for most key minerals around the world. And, says Bhadra, "These two economic centers are not promising to come back to a significantly higher trajectory in the near term."

Additionally, regulatory actions by the United States and other countries that limit the use of coal in power generation have significantly dampened demand for one of the industry's biggest products.

And third, says Bhadra, "Some large mining companies are not expected to reduce production levels even in the current low-price regime as a competitive strategy. By leveraging their large and low-cost-of-production deposits, they are aiming to retain and grow market share by trying to reduce participation of smaller mining companies with higher marginal cost of operations."

This extended period of low pricing has damaged mining companies' financial positions. According to Statista, the net profit margin of the top 40 mining companies, which account for almost all industry activity, fell from 25 percent in 2010 to just 2 percent in 2013, before climbing back up to 10 percent in 2014.

Without the funds to invest, global mining exploration is expected to fall 10 to 15 percent to $10 billion in 2015, according to SNL Metals & Mining. The decrease would be the third consecutive annual drop and would leave global spending at the lowest level since 2009.

Remote Mines, Higher Risk

At the same time, the cost of developing a new mine has never been higher.

"The large, easily accessible properties are more mature and being mined out," says Gingrich. "We're seeing development in more remote, higher-risk locations, such as Mongolia, parts of Africa, and the arctic in Canada."

According to the World Economic Forum (WEF), about 40 percent of mining exploration investment in recent years "has focused on remote regions in South America and Africa."

These distant and isolated mining projects tend to be larger scale, with higher costs and more complex infrastructure requirements. WEF estimates that 60 to 80 percent of project costs for distant mines are just for infrastructure.

An additional factor adding to the complexity and expense, says Gingrich, is that while "larger tonnage mines have tended to be open pit, we're seeing more underground mine development."

Finally, mining operations are under increasing regulatory pressure in both developed and developing countries to limit emissions, waste and water use.

Market Strategies

Engineering firms are choosing different paths to succeed within these difficult market conditions.

"Even in a soft market, clients are still producing," says Kevin Beauchamp, principal and mining business leader at Golder Associates. "The challenge for us is to understand their business and provide solutions that work for our clients."

For example, several commodities, specifically copper, nickel and base metals, are strengthening, he says.

While Amec Foster Wheeler offers its mining clients a full slate of mining services, Gingrich says one of the most active services has been helping firms fine-tune their business processes.

"We've been more active in financial analysis, process engineering, due diligence," says Gingrich. "We are looking through their processes and methodologies to find capital efficiencies."

MWH Global is using its water expertise to capitalize on the increased environmental

Global Spending on Non-Ferrous Metals Exploration (billions of U.S. dollars)

2010	$12.1
2011	$18.2
2012	$21.5
2013	$15.2
2014	$11.4
2015	$10.0 (est.)

Source: SNL Metals & Mining Corporate Exploration Strategies


Conveyer belts transport ore through a mine.

OLIVIER LANTZENDORFFER/ISTOCK

focus on the mining industry. "We have brought municipal drinking and waste water technology to mining companies so that minerals and energy can be exploited without compromising the sustainable supply of water for communities and the environment," says Resa Furey, principal market analyst for natural resources and mining at MWH Global.

Seeing an Uptick

Looking forward, Beauchamp sees signs that the market is firming up. "We're seeing a lot more front-end study activity, which are generally the precursors to development."

Gingrich concurs. "We're doing more due diligence work, and our mine assessment group is fairly active." However, he adds, "What we're not seeing are those projects that are within six months of being kicked off. There's a lack of companies being ready to make a major capital investment."

Furey expects the "soft market" to last about two more years. As the sector begins to expand, she sees significant opportunities for her firm to help clients deal with the growing climate change threat.

"Climate change affects everything from mine planning—will the water be available for the life of the mine?—to the engineering design basis for water or tailing storage facilities," she says. "We have seen and expect to continue to see an uptick in engineering and environmental services that correspond to climate change adaptation and mitigation."

Gerry Donohue is ACEC's senior communications writer. He can be reached at gdonohue@acec.org.

ACEC Urging Quick Action on Multiyear Transportation Bill as Congress Reconvenes

The Senate approved a six-year, $360-billion highway bill prior to the summer recess, so all eyes now turn to House leaders to fulfill repeated pledges to produce a long-term bill when House members return in September.

The Senate voted 65-34 to pass the *Developing a Reliable and Innovative Vision for the Economy Act* (DRIVE Act), an ACEC-supported six-year reauthorization of highway, transit and safety programs that features a 12 percent increase in average annual funding over current levels. The legislation includes a transfer to the Highway Trust Fund that will provide funding for the first three years of the bill.

The Council lobbied heavily in favor of the Senate bill and is now pressuring the House to deliver on vows to produce its own long-term transportation legislation in September. Congress separately approved a three-month MAP-21 extension through October 29 and transferred an additional $8 billion into the Highway Trust Fund to maintain current funding to states and provide time to agree on a final bill.

"The discouraging reality is that the clock is again ticking on yet another short-term extension," said ACEC President Dave Raymond following action on the bills. "When lawmakers return from summer recess after Labor Day, they will try to accomplish something in about six weeks that hasn't been achieved in six years—agree on a satisfactory way to pay for a long-term bill and get it to the president's desk."

The six-year DRIVE Act provides $275 billion for highway programs over six years, including $256 billion in formula funds to the states, $1.8 billion for TIFIA loans and credit assistance, and $2.1 billion in grant assistance for major projects. Annual state highway funding grows from the current $37.8 billion to $39.6 billion in F.Y. 2016, ramping up to $45.7 billion in F.Y. 2021.

Transit programs will receive $75 billion over six years, including $59.5 billion in formula funds to state and local governments and $14.6 billion for capital investment grants. The bill also authorizes $8.9 billion over four years from the General Fund for passenger rail programs, including $6.6 billion for Amtrak and $2.2 billion for state rail infrastructure improvement grants.

The bill transfers $45 billion from the General Fund to the Highway Trust Fund to supplement existing gas and diesel taxes and other transportation revenues. The budget offsets are projected to support program funding through F.Y. 2018, at which point additional congressional action would be necessary.

The DRIVE Act also contains provisions recommended by ACEC to streamline project delivery and to fund multistate pilot projects to study alternative financing mechanisms, such as vehicle-miles-traveled fees.

Tax Reform Focus Narrows

The prospects for comprehensive tax reform in 2015 have dimmed, but tax writers in the House continue to pursue more limited reforms designed to improve the international competitiveness of U.S. businesses.

House Ways and Means Committee Chairman Paul Ryan (R-Wis.) and the White House initially sought to pursue legislation to reduce corporate tax rates in response to concerns over U.S. firms reincorporating overseas or being acquired by foreign competitors. After ACEC and other business organizations expressed that lowering corporate tax rates would disadvantage pass-through businesses such as S corporations and partnerships, tax writers have put aside the discussion of corporate and individual rates until Congress and the administration can agree on a more comprehensive approach to rewrite the tax code.

As an alternative, Rep. Charles Boustany (R-La.) has released draft legislation that would create a lower tax rate for profits from qualified property, such as patents or inventions. Several European countries have enacted similar incentives—generally known as an "innovation box"—for firms to perform work domestically. The innovation box concept would likely be paired with a mandatory tax on overseas earnings, some of which would help fund the federal highway program.

CHARLES DHARAPAK/AP

Rep. Charles Boustany (R-La.)

Any tax package is likely to also include an extension of expired tax provisions. The Senate Finance Committee approved a two-year extension of 52 tax provisions that expired at the end of December. These include several backed by ACEC, such as the R&D tax credit, bonus depreciation, higher expensing levels and energy tax credits. The legislation would be in effect for 2015, retroactive to January 1, and 2016. The House is considering similar approaches on tax extenders, with final action expected in the fall.

House, Senate Move ACEC-Backed Energy Bills

The Senate Energy and Natural Resources Committee adopted *The Energy Policy Modernization Act*, which aims to boost reliability and security of the nation's oil, natural gas and electricity infrastructure. The measure includes a number of provisions advocated by ACEC, including establishing an interagency committee to focus on the "energy-water nexus," with the goal of identifying sustainability best practices.

To expand and protect the power grid, the measure includes ACEC-backed provisions to enhance the authority of the U.S. energy secretary to protect against cyber threats and develop new models of electricity storage, distributed generation and micro-grids. The measure also expedites exports of liquid natural gas (LNG) through a streamlined permitting process.

Emphasizing renewable energy, the Act adds hydropower to the list of renewable energy sources and supports the development of geothermal energy sources.

Similar legislation has been approved at the subcommittee level in the House. The House bill also requires the Federal Energy Regulatory Commission (FERC) to coordinate interagency pipeline environmental reviews, setting deadlines for agencies and requiring that reviews take place concurrently to expedite the process. Leaders in both chambers say they hope to produce a bipartisan compromise bill by the end of the year.

ACEC Responds to Proposed Overtime Rules

ACEC has raised concerns over a proposed rule from the Department of Labor (DOL) that would significantly expand mandatory overtime under the Fair Labor Standards Act (FLSA). These requirements were last updated in 2004.

Under the current rule, employees who earn less than $455 per week or $23,660 per year must be paid time and a half when working more than 40 hours per week. Employees who earn between $23,660 and $100,000 per year are eligible for overtime pay unless they are exempt because their duties are primarily professional, executive or administrative in nature.

The proposed rule would increase the salary threshold from $455 per week to approximately $970 per week, or $50,440 per year, and then adjust it annually based on growth in wages or inflation. The highly compensated employee threshold would increase from $100,000 to approximately $122,148 and would also be adjusted annually. DOL did not propose changes to the duties test for exempt employees, but it requested comment in this area.

ACEC submitted comments on the proposed rule that express concern about the significant jump in the salary threshold for nonexempt employees over a period with low inflation and a recession. The Council also recommended updating the salary threshold every three years, instead of annually, to mitigate administrative costs.

DOL will review the comments on the proposed rule and is expected to release the final rule in 2016.

ISSUES ON THE MOVE	WHAT'S NEXT
Surface Transportation Reauthorization	Expected House action in September
Tax Legislation	Action on tax extenders in the fall; possible international provisions
Proposed Overtime Rules	Final rule in 2016
Bipartisan Energy Package	House, Senate floor action in the fall

ACEC Reviewing Obama Administration's Clean Power Plan

The Obama Administration has released its final Clean Power Plan (CPP), mandating significant reductions in CO2 and other emissions and setting aggressive targets for increasing the use of renewable energy.

ACEC's Environment and Energy Committee is reviewing the new plan ahead of anticipated challenges in the courts as well as legislative challenges in Congress this fall.

The CPP mandates a 32 percent reduction in CO2 emissions by 2030, a target that will fall most heavily on coal-dependent states such as Wyoming, North Dakota, Kentucky and West Virginia. The plan envisions a portfolio of electricity generation by 2030 that consists of 27.5 percent coal, 20.7 percent renewables, 32.6 percent natural gas and 19.1 percent nuclear.

The CPP's release could affect congressional efforts to move pending bipartisan energy bills. The Senate bill—which includes provisions to facilitate the development of new models of electricity storage, distributed generation and micro-grids, as well as the codification of the DOE's Quadrennial Energy Review—aligns more closely with the CPP than the House bill.

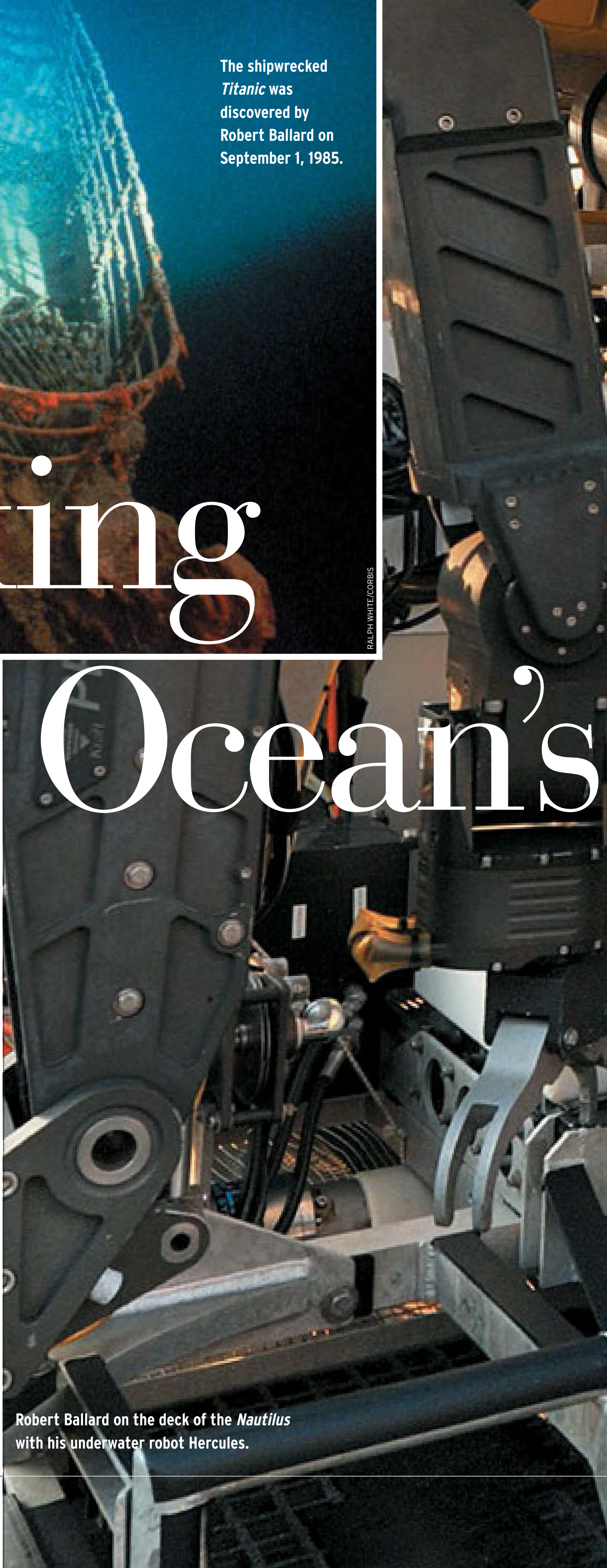
BLOOMBERG/GETTY IMAGES

For More News

For weekly legislative news, visit ACEC's *Last Word* online at www.acec.org.

The shipwrecked *Titanic* was discovered by Robert Ballard on September 1, 1985.

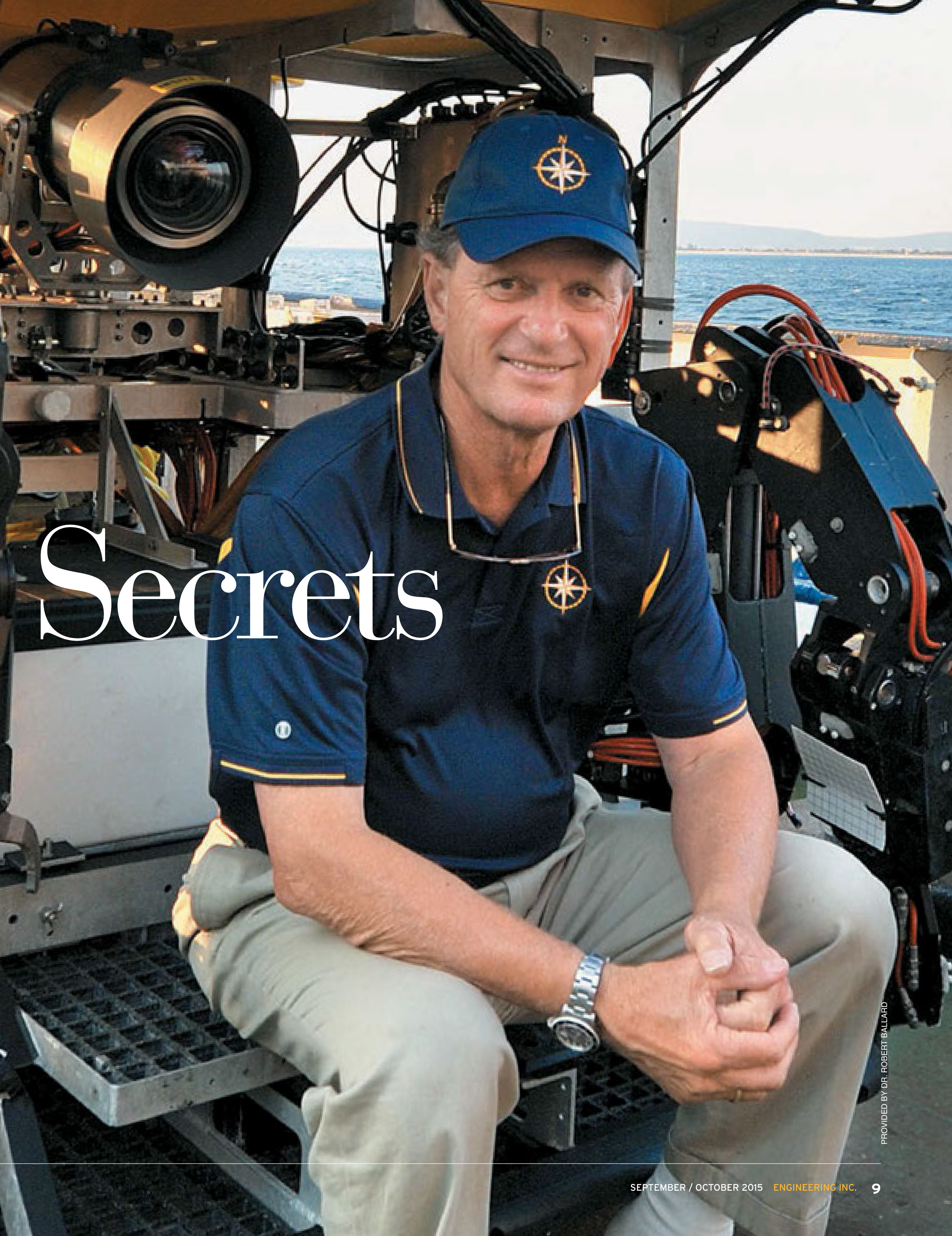
Unlocking the Ocean's



Robert Ballard on the deck of the *Nautilus* with his underwater robot Hercules.

Best known for his 1985 discovery of the *Titanic*, Dr. Robert Ballard's many achievements in oceanic exploration are legendary. Finding the German battleship *Bismarck*, the lost fleet of Guadalcanal, John F. Kennedy's *PT-109*, hydrothermal vents in the Galapagos Rift and "black smokers" in the East Pacific Rise—the list of discoveries is long.

As an author and historian, Ballard uses his fascinating journeys to promote science, technology, engineering and math (STEM) to students throughout the world. To honor his achievements, ACEC will present Ballard with its Distinguished Award of Merit at the upcoming 2015 Fall Conference in Boston. In this exclusive interview with *Engineering Inc.*, Ballard discusses both his past achievements and future goals. >>



Secrets

PROVIDED BY DR. ROBERT BALLARD


PROVIDED BY DR. ROBERT BALLARD

The crew of the *Nautilus* includes engineers, scientists and educators.

ACEC: You are widely acclaimed for extraordinary achievements in undersea exploration, including discovering the *Titanic* and the *Bismarck* and making the first manned exploration of the mid-ocean ridge. At 73, what major discoveries remain on your to-do list?

DR. ROBERT BALLARD: People commonly ask me, "What do you hope your next discovery will be?" The fact is I haven't a clue. When you look back on my 55 years of mounting more than 150 expeditions, it wasn't the discovery of the *Titanic* or the *Bismarck* or *PT-109* or even the Lost City. What truly has been the most amazing thing was when I went looking for one thing and found something else far more important.

Clearly, our 1977 discovery of the hydrothermal vents and the new life forms was really the seminal discovery of my career. It helped us further understand the origin of life on our planet. We did not know such a thing existed—an entirely complex ecosystem that was not deriving its energy from the sun, but energy from the earth itself, and possessing the ability to process poisonous hydrogen sulfide and sulfuric acid through their body, which would kill any other creature.

Just two years later, in 1979, we discovered the giant black smokers on the Galapagos Ridge, which really aren't smokers, but a part of a hydrothermal vent system. Before we made that discovery, we couldn't explain how the ocean got its chemistry. We believed the logical chemistry source of the ocean were the rivers such as the Nile, the Mississippi and the Amazon.

When we discovered the giant black smokers running along the entire length of the mid-ocean ridge, we also discovered that the entire volume of the world's oceans is flowing inside the fractures of the mid-ocean ridge and coming out every six to eight millions years—a gigantic internal circulation system right inside our planet, and no one knew. Those are really fundamental "you got to be kidding" discoveries.

So, going back to the question of what will I find next? Who knows? But I will bet you it will be exciting.

ACEC: What is the Lost City, and why was that discovery so important?

BALLARD: That was another discovery in 2002, when my old team was moving between segments of the mid-ocean ridge, which is where the earth is creating its outer skin caused by the tectonic plates that are separating. Most believed those offset fractures were pretty boring and not worth investigating, until one day the team was exploring one area where the plates were separating. The plan was to go to another location to look at another part of the transform fault, but instead of repositioning the ship, which could take hours, and repositioning the vehicles, which could take hours, they decided to just drive the probe over there and suddenly came upon these gigantic structures (90 to 200 feet high) that looked like a city of skyscrapers.

And they were white, while everything in the mid-ocean ridge is black. So when they saw these white towering peaks, similar to the giant stalactites at Carlsbad Caverns, all coming from the ocean floor, they took samples and discovered it was calcium carbonate (limestone).

Because of its unique chemistry, the field also hosts novel life forms that live in the absence of sunlight and thrive on methane and hydrogen gases given off during alteration of the rocks. It showed that life can live in much more extreme environments than we ever thought, and for many, dramatically accelerated the belief in the probability of life existing in outer space.

ACEC: Educators laud your JASON Learning project for its revolutionary approach to getting students engaged in STEM education. What has been the secret to that program's success?

BALLARD: I am no longer associated with JASON because they drifted off in a direction different from where I wanted to be, which is not a problem. But it's no longer live and interactive, and I think it was the live and interactive component that turned so many kids on. In response, we created a new program—the Ocean Exploration Trust, which blends education and ocean exploration to promote science, technology, engineering and mathematics fields using the excitement of exploration and technological innovation.

I am a firm believer that children are born scientists. The first question they ask is "why?" And then parents attempt to explain, and the child follows with another "why?" By the third "why?" they've exhausted all the parent's answers. What we're trying to do is make sure we don't extinguish that flame of curiosity that a child is born with.

What I've found by doing live exploration, and putting children in direct contact with real scientists, is soon they understand that the reason scientists are out there is because of what they don't know. Scientists embrace the fact that they don't know. Our new community-based STEM program is involving millions of children in the interactive exploration of the *Nautilus*. Anyone can go to Nautiluslive.org to see the *Nautilus* in action.

We receive thousands of questions from children who follow us, and we have the technology to put them in contact with experts who provide answers in seconds. Just like JASON, the secret is the engagement of children on the large scale in pursuit of the truth.

ACEC: One of your current initiatives is called "Unknown America," in which you are mapping the ocean floor as far as 200 nautical miles from U.S. shores. Why is this project so important?

BALLARD: Half of our country is under the ocean and we own it, but we have better maps of Mars than we have of those unchartered parts of the United States. That seems a little crazy to me. We have what we call the Corps of Exploration on the *Nautilus*, consisting of scientists, engineers, communicators, educators and students, who are dedicated to understanding the other 50 percent of our country that lays unexplored.

Why? Because it's full of resources, it's full of fisheries, it's full of minerals and gas and places that can be set aside as underwater Yellowstone and Yosemite parks. But before you can enjoy those kinds of things, you have to know what you own. So we're committed to mapping that part of America until it can be no longer classified as unknown.

ACEC: As an explorer, discoverer and historian, why do you believe the world's growing knowledge of the ocean is so important?

BALLARD: We're not escaping Planet Earth. We have a wonderful planet that we live on. Consider that 95 percent of the Earth's population lives on less than 3 percent of the planet. That's because 72 percent of the Earth is covered in water.

Of the 28 percent of the Earth that is land, 40 percent is uninhabited, such as the polar regions and deserts. We have no option but to move out into the ocean and colonize. I still have one more trick left in me, and that will be the colonization of the world's oceans. I'm actually working hard on the design right now.

If you look at the history of the human race, it began with a hunter-gatherer culture. Nomadic people had to move around because they quickly depleted fruits hanging on the trees or animals running around in the woods. But then they began to cultivate plants and greatly increase productivity of the wild land. They began to domesticate animals and develop herding skills, and all of a sudden they didn't have to hunt deer when they could grow chickens or pigs or cattle.

Right now we are treating the ocean as a hunter-gatherer society. We are catching wild animals in the ocean, which is a very inefficient way to capture protein. We need to farm and herd and increase the productivity of the ocean. Before we can do that, we have to understand where we are going as a human race.

Consider the Malaysian flight that disappeared. If we can't find that plane, despite all the resources that were expended, that should tell you an awful lot about how little we know about the ocean.

ACEC: What do you personally enjoy best about ocean exploration?

BALLARD: When you consider that the percentage of the oceans we actually explore is so small, and that the discoveries we've made have rewritten science books from that 1 or 2 percent ocean exploration, you get an idea of what conceivably still is waiting for us. That's why I created the program I have now, so we can do fundamental exploration. And the *Nautilus*—one of only two American ships doing exploration—is literally going places where no one has gone before, hoping to continue to make new discoveries.

If you look at the *Nautilus*, most of the key intellect involved in our expeditions is not physically on the ship. The ship instead is full of students, teachers, educators and young people, as we try to inspire the next generation. But there are very few scientists aboard because we are in an exploratory mode.

For me personally, you would have to consider the movie *Avatar*, and the point when the paraplegic star's spirit was transferred to a Na'vi. The first thing he did when he woke up was run, not caring about the fact he was now a different species that now had blue skin and a tail. All that mattered was having the ability to feel the wind in his face again. Well, Hercules—my underwater robot—is my Na'vi. It carries my spirt and gives me the freedom to do things my human body cannot.

When I go to the Inner Space Center (at the University of Rhode Island's Graduate School of Oceanography), I can go into a room, and through Hercules, spend a day exploring off the Galapagos Islands. I can then go home, have a drink with my wife and watch the sun go down in Connecticut. What excites me is not just inspiring children, or exploring the unknown, it's all of that and having a role in preparing the next generation for a future that today they can only imagine.

ACEC: What was your reaction to being chosen to receive ACEC's Distinguished Award of Merit—the Council's highest award bestowed upon an individual?

BALLARD: I'm extremely grateful. It's an honor indeed, and it shows that rumors of my demise are greatly exaggerated. I've just recently celebrated my 73rd birthday, but believe me, I'm just hitting my stride. ■

Robert Ballard's *Nautilus* crew views the Gulf of Mexico during a mission to map the ocean floor along the U.S. shoreline.

PROVIDED BY DR. ROBERT BALLARD

Positive Impressions

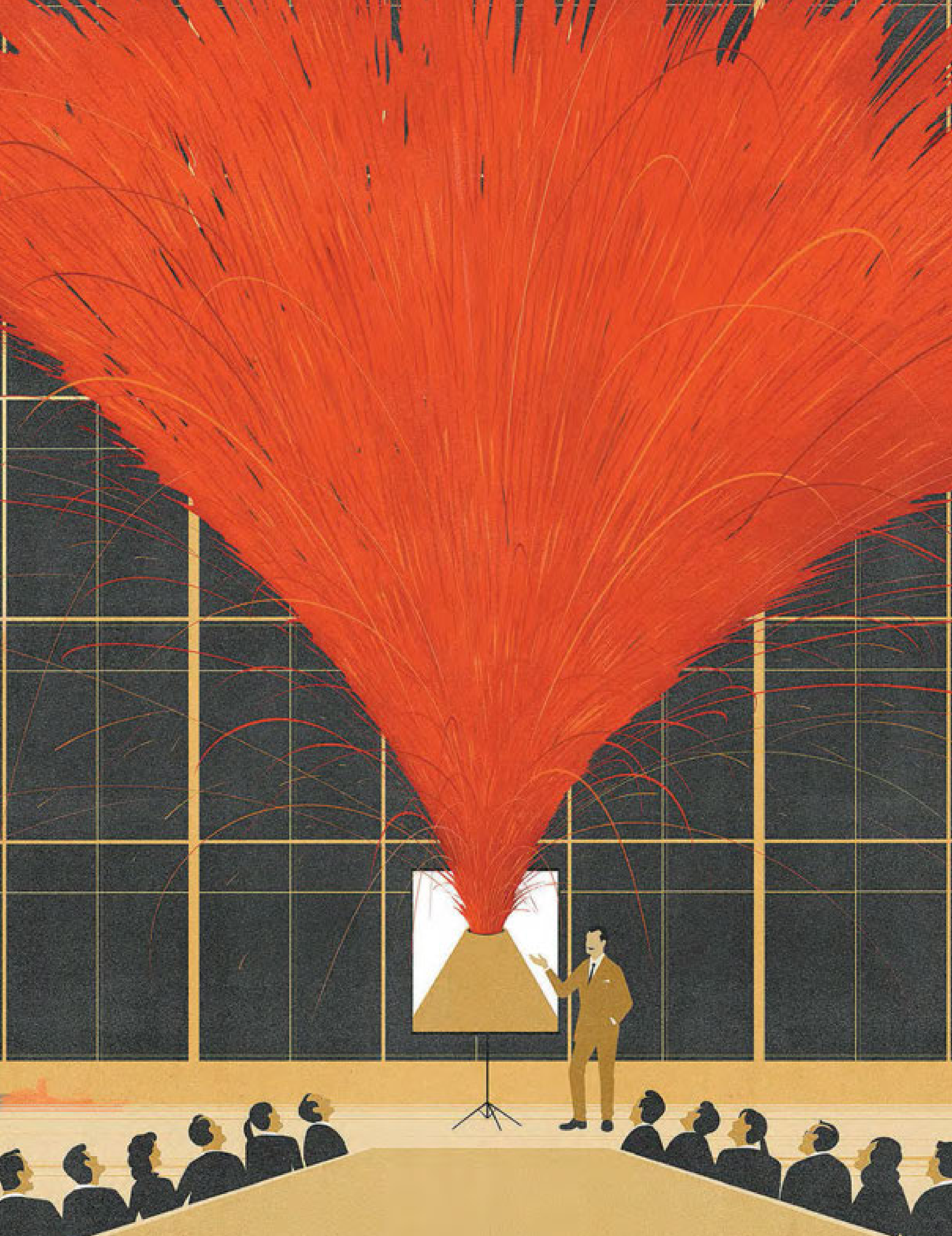
Making presentations that win work

By Bob Violino

An engineering firm might have the best skills, experience and resources to handle a particular project for a client. But without a top-notch presentation at the outset, the deal could easily go to a competing firm.

Experts say a firm's initial presentation is extremely important in ultimately winning the contract. >>

FRANCESCO BONGIORNI



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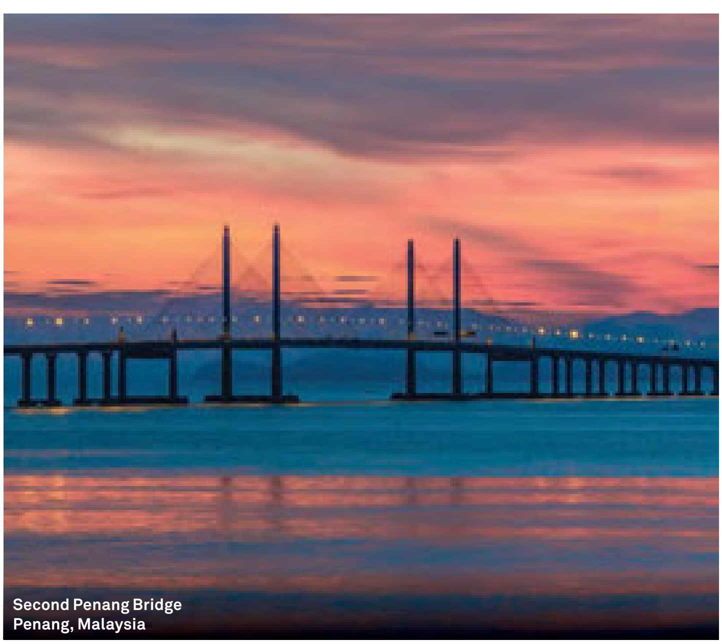
Houston, Texas

Taizhou Bridge
Jiangsu, China



Second Penang Bridge
Penang, Malaysia

"It is of pinnacle importance to make a positive first impression," says Hilari Weinstein of High Impact Communication, a specialist who guides engineering firms in making presentations. "A first impression acts like a filter through which others process everything they experience after it."

"Talking too much and ineffective listening will guarantee failure."

MICHAEL LEFEBVRE
GRAEF

Clients weigh initial information more heavily than later information, Weinstein says. "That information involves what is seen, heard and felt," she says. "As communicators, we deliver 1,000 signals per minute. So every contact and communication after that can either enhance or diminish the first impression that was formed."

Engineering firm executives understand how important it is to present well at the outset, especially considering how competitive the market can be. "The ability to establish rapport and a feeling of trust has always been a goal in the procurement process," says Michael Lefebvre, vice president of GRAEF.

"Clients tend to look for reasons to reduce the competition and make their final decision process less complicated," Lefebvre says. "A bad first impression is a proven way to make sure you are quickly eliminated from consideration."

Common Mistakes

Despite the importance of making a good first impression, many firms make common mistakes when presenting themselves.

"The biggest mistake has little to do with the mechanics of presenting," says Jim Rogers, of Unbridled Revenue, Inc., a consultant who helps engineering firms win more contracts. "It is a failure to understand what the client really wants.

"Your decision-makers don't really buy an 'artifact' such as a bridge, airport or water treatment plant," Rogers says. "People really want to either attain or avoid something. We want to attain recognition, or money and what it brings, or to leave a legacy. We want to avoid trouble, criticism and unnecessary effort."

For example, an overwhelmed project manager with a newborn at home wants to avoid unnecessary effort, Rogers says. "Ask yourself what you offer to do that for him," he says. "One way might be for you to do it all under one roof and not have teaming partners."

Not focusing on the needs of the client during a presentation is a huge mistake, Lefebvre says. "Talking too much and ineffective listening will guarantee failure," he says. "Regardless of the sophistication of the client, it is important to be genuine in your communications."

Another mistake is relying too much on "slideware," Rogers says. "PowerPoint has been under siege for two decades, which is a bit unfair," he says. "There is a place for it. But when misused, slides can create a barrier between you and your decision-makers."

Presenting in a lackluster manner can also lead to failure. Going into "automatic" mode and presenting generic information "comes across as boring, without authority and uninterested in the client," says Susan Murphy, of Murphy Motivation and Training, a presentation and management skills coach.

This kind of presentation "is the default for most nervous presenters or teams, playing what they perceive to be safe," Murphy says. "The client has heard it many times, often in the same day. It is boring, shows no vigor, hides personalities and focuses on the speaker, not the listener."

Along the same lines, giving scripted presentations and responses is a bad idea, Weinstein says. "Actors train years to deliver the script in a natural way," she says.

Another common shortcoming is the failure to clearly articulate what differentiates a firm from its competitors.

In general, many firms are simply not well prepared for presentations, Weinstein says. "I often find this to be one of the most pivotal reasons people hire me when they have a big client presentation," she says. "Too often, presentation teams, left to their own devices, spend most of their time playing with slides or trying to wordsmith their talk, leaving insufficient time to practice aloud as a group and individually."

Best Practices

Experts offer a number of suggestions to counter these and other presentation errors.

One key part of preparation is being aware of what are the primary client concerns.

Practice responding to anticipated questions, Weinstein advises. "Collect questions from past interviews and allow folks to practice answering them and get feedback," she says. "For certain types of questions, it may be worthwhile to write out company-preferred responses. This is not a script to be memorized but a guide to ensure clarity and consistency within the organization."

"I always suggest that a team wrap up their presentation with a segment that focuses on the most powerful reasons why the client should select you."

HILARI WEINSTEIN
HIGH IMPACT
COMMUNICATION

Practice your presentation with an outline, Weinstein says. Use note cards, and then go over each segment in portions of no more than a minute or two. Master one segment before moving on to the next, but again, do not try to memorize a script, she says.

Gearing the presentation to the needs of the specific client is of the utmost importance.

"For each of your client's hot buttons, match that up with a truly unique feature or solution you bring to the table, and underscore how that will be of value to or benefit the client. Then prove your ability to deliver that outcome," Weinstein says. "I always

suggest that a team wrap up their presentation with a segment that focuses on the most powerful reasons why the client should select you."

Another way to ensure that your presentation stands out is to leverage a unique experience that showcases your personality. "Tell a story," Rogers says. "Stories paint pictures and are easily recalled. What's more, stories call people to action. Think about the founders and other great leaders and sellers in your company. I'll bet they were good storytellers."

Presenters need to be effective speakers and to learn the art of persuasion. It's a good idea to join an organization such as Toastmasters to develop skills, Rogers says. Memberships cost less than $100 a year. "The expense is in the time and effort you devote to it," he says.

"Tell a story. Stories paint pictures and are easily recalled. What's more, stories call people to action. Think about the founders and other great leaders and sellers in your company. I'll bet they were good storytellers."

JIM ROGERS
UNBRIDLED REVENUE, INC.

Rogers recommends designing presentations from scratch on paper or a whiteboard. "Never begin with a prior presentation," he says.

Think in terms of the images that you want people to recall when they're later making a decision, Rogers adds. "Then think of all the ways—other than slides—to create the image; for example, a vivid story, a prop like a toy or flipchart."

Firms might want to consider using newer technologies to illustrate their capabilities, including images produced through 3-dimensional laser scanning and printing.

"Using the technology in the presentation that you intend to use on the project is a good approach," Lefebvre says. "That technology may be specialized software that will be used to identify and vet out possible project solutions and alternatives. It could also include social media and other presentation resources that would be used to communicate with the client or other project stakeholders during the project. These typically work because most clients have a desire to learn about new approaches, methods or resources for project success."

It's also important to train staff in areas such as leveraging unique experience and personality, using persuasion, creative writing and other communication techniques, Weinstein says. "You would not expect the people within your organization to be proficient with a business tool without extensive training to ensure they use that tool optimally," she says.

Also, be prepared for the situational interview, a recent presentation trend that requires quick thinking. "This is where the client gives the interview team a project challenge on the spot with 20 minutes to come up with an approach as a group, using a flip chart to record and illustrate that approach," Murphy says.

This allows the client to see how the team works together and how flexible and creative the members are. "Scary, but very effective," Murphy says.

These newer approaches to presentations do work, Murphy says, because they show—rather than tell—the client who the team members are, how smart they are, how experienced they are, and, most important, how devoted to the client they are. "The authenticity of each member of the team is displayed," she says.

Regardless of what steps firms take to become better at presenting, the improvement process will take time and effort.

"My best advice is that you cannot take a crash course to learn to present well; therefore, don't wait until a big presentation is imminent," Rogers says. "Learning to present well is a process, not an event." ■

Bob Violino is a business and technology writer based in Massapequa Park, N.Y.

Low Water,

Engineers are developing solutions to ease the impact of the Southwest's great drought

Water levels at California's Lake Oroville are nearing record lows.

By Samuel Greengard

The Southwestern United States has historically experienced periodic droughts, but over the past several years, the region has faced one of the most severe droughts ever. Lack of precipitation—particularly the diminished snowpack in the Sierra Nevada Mountains—has become so severe that many reservoirs have dropped to 25 percent or less capacity, prompting California state officials to warn that water supplies could be completely depleted if current trends continue.

High Hopes

SULLIVAN/GETTY IMAGES

Texas also is facing increasing drought concerns, thanks to growing population centers and low reservoirs, though parched areas of the state have received significant rainfall recently—in some cases heavy rains have led to flooding.

"The Western states are experiencing a significant water deficit, and there is currently no end in sight," says Mike Orth, executive managing director for the Americas for Black & Veatch's water business. "The cause and effect can be debated by politicians, scientists and others. But all of this doesn't change the basic fact that we need to take steps and plan for extreme events."

There are no simple answers. Although the challenges involve a mix of political, social and environmental factors, the fact remains that engineers will be at the center of all solutions. A number of existing and emerging technologies could help alleviate water shortages, though some are extraordinarily expensive and face formidable environmental challenges. Dan Rodrigo, senior vice president at CDM Smith, says one of the key approaches is that "We have to change our mindset about water. Right now, we mostly use water one time and discard it. This is not a viable long-term strategy."

Running on Empty

A starting point for understanding the Great Drought is to recognize that severe droughts aren't entirely out of the norm for California and other portions of the Southwest. "Historically, looking at tree rings and geologic data, there are periods of 10- and even 50-year droughts," Rodrigo says.

Whether human-induced global climate change is responsible—and to what degree—is secondary to the fact that "an average to wet year is more the exception than the rule," says Dave Bennett, Stantec's water practice leader for the U.S. West. Adds Orth: "We've gone through periods of drought conditions, but the droughts have always been smaller cycles, and we've been able to muddle through those events."

Of course, any discussion of water in the Southwest also involves economics and politics. Bennett points out that new water supplies have historically been used to attract development and spawn growth. At the heart of the issue, he says, are society's overall goals and objectives. "The issue isn't whether we can accommodate more population. From an engineering perspective, that's entirely possible. The question is: What do people want and how much are they willing to pay for water? Do people want water rates to go up faster than the rate of inflation just so that developers can build new houses and add to the population?"

Right now, the primary focus is on water conservation. In April, the California Department of Water Resources reported the lowest snowpack in recorded history, prompting California Governor Jerry Brown to order cities, towns and water districts to reduce water use by 25 percent. The California State Water Resources Control Board estimates that this will result in 1.5 million acre-feet of water through the remainder of the year. That's roughly equivalent to one large reservoir. As a result, lawns are turning brown, cities are eliminating grass from medians and some residents are replacing grass and other plants that require heavy watering with drought-resistant trees and shrubs. In addition, the state is stepping up efforts to provide rebates to replace old and inefficient appliances with more efficient models.

Yet, agriculture accounts for approximately 90 percent of all water use in California. Much of this water is pumped out of the ground from aquifers and underground basins—and these supplies are also heavily depleted. In many cases, these sources have been drained to the point where subsurface spaces have receded by 30 feet or more, rendering the aquifer unusable in the future. "Once they reach the point of collapse, and there is severe damage to the groundwater basin, you have lost all ability to use it in the future," explains Rodrigo.

Meanwhile, Bennett says, farmers have instituted some effective conservation methods, but there's a need for more technologically advanced systems that rely on sensors and iPads to deliver the right amount of water for crops. These systems can reduce water usage by 25 percent or more.

However, even if all these issues were addressed, California still wouldn't have enough water to go around during drought periods. Moreover, other areas of the Southwest would continue to feel the pressure of limited water supplies. At present, Colorado River Basin reservoirs are low due to below average snowpack in the Rocky Mountains, while desert cities such as Las Vegas and Phoenix continue to grow. As Bennett says: "We need to make some significant changes."

"Right now, we mostly use water one time and discard it. This is not a viable long-term strategy."

DAN RODRIGO
CDM SMITH

Engineering a Wetter Future

If there is a silver lining to the Great Drought it's that it has focused attention on addressing long-term problems that won't disappear with a wet winter or miracle spring snowfall in the mountains. In the past, panic over water has ebbed and flowed in response to short-term droughts and precipitation. This time, California and other Southwestern states are beginning to earnestly study advances in engineering and technology and reassess government and public policy frameworks to build more sustainable water supplies.

One technology attracting attention is seawater desalination. It is already used extensively around the world, particularly in arid regions such as the Middle East. California currently has 23 desalination plants in use for brackish water and three for ocean water. A major facility opening in late 2015 in Carlsbad will be the largest plant constructed in the U.S. and is expected to supply San Diego with 50 million gallons of water daily. Richard Mills, chief of the Water Recycling and Desalination Section at the California Department of Water Resources, says that desalination currently presents three major challenges: high energy input required for the desalination process, the impact on sea life during water intake and brine disposal. Unfortunately, "There have been no breakthroughs, but a lot of things have been analyzed and tested that could change the picture," he says.

The high cost of desalination is also an obstacle. The Carlsbad Poseidon Desalination Project will cost more than $1 billion. But, "As water costs rise and water becomes increasingly scarce, the economics look better," Orth says. Particularly in California—and especially during a drought—there is a limit to how much freshwater or wastewater can be claimed and consumed. "Desalination will probably never become the primary technology, but it is an increasingly attractive option." In some cases, desalination can also be used with brackish inland water supplies, which are relatively common in the Southwest. Yet, as Keith London, president and CEO of Kennedy/Jenks Consultants explains, highly efficient water management systems are needed to realize the full benefits of desalination. "We are seeing agencies wringing out inefficiencies and managing their demands better, but it is an ongoing process," he says.

An approach that almost everyone agrees is critical is water reclamation, through both direct and indirect potable use. Although some treated wastewater has been used for years to water crops and golf courses, there is more widespread use of filtering and treatment systems, and the technology is becoming more affordable and efficient. "By advancing treatment levels, we can begin to use reclaimed water for drinking. Instead of taking a one-and-done approach, it can be used multiple times through the same distribution system," Bennett says.

The Poseidon Water Desalination Plant in Carlsbad is scheduled to begin operation in mid to late 2015.

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"Desalination will probably never become the primary technology, but it is an increasingly attractive option."

MIKE ORTH
BLACK & VEATCH

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The Orange County Groundwater Replenishment System in Fountain Valley, Calif., designed by CDM Smith, shows how engineering innovation can help address drought-related water supply issues. The system is one of the world's largest facilities for transforming wastewater, previously discarded into the ocean, into enough premium drinking water that serves more than 500,000 residents a year. The project received the 2009 Engineering Excellence Awards' Grand Conceptor Award as the year's most outstanding engineering achievement.

Direct potable methods typically take place on the same or nearby water treatment system, while indirect potable methods involve the discharge of treated wastewater into a river, lake or aquifer, allowing nature to purify it further. Mills says that California reused 669,000 acre-feet of water in 2009, but the figure is expected to rise to 1 million acre-feet by 2020 and 1.3 million acre-feet by 2030. The state offers local agencies loans and incentives to move forward with water reuse projects.

An advantage of indirect potable, Rodrigo says, is that during wet periods water can be deposited, injected or even diverted into aquifers and groundwater basins, and water from reservoirs and other sources can instead be used. During dry years, the water can be drawn out. Removing concrete from the floor of flood control channels and creating a "soft bottom" also allows water to soak into the ground. "A conjunctive-use approach—essentially groundwater banking—can provide much greater flexibility and prevent underwater basins from collapsing," Rodrigo says.

A New Era Emerges

Rodrigo and others agree that the era of building new dams and reservoirs is over. "We may see a few new reservoirs built, particularly in Texas, but the political climate in California makes them more difficult." Ultimately, he says, "We need a combination of technologies and approaches used together. We need to move toward a One Water approach where everything is viewed as part of a single system." Mary Lou Cotton, a water resources expert at Kennedy/Jenks, adds, "The good news is that the water is readily available. We just need to build the infrastructure to capture and manage it."

But this will also require changes in the way counties, cities and agencies approach water management. For now, a huge problem is that conservation efforts typically result in higher water rates for consumers, prompting conflict in agency agendas. Moreover, in this changing environment, utilities now need to purchase water from new suppliers. In the case of agricultural interests, the cost can hit $700 per acre-foot, compared with a near zero cost basis in the past. In the end, three critical needs exist, according to Black & Veatch experts: to strengthen the management of water demand, develop more stable water sources and devise better rate structures.

"Watersheds do not follow geopolitical boundaries. We can engineer systems that follow geopolitical boundaries, but then we are at odds with nature," Rodrigo explains. In the future, "We may see the emergence of watershed agencies that manage multiple communities and oversee the entire watershed, including water supply, waste treatment, watershed and environmental issues. We need to see greater cooperation and integration so that we're able to manage water in the most efficient way possible."

London views the Great Drought as both a challenge and an opportunity. Society and public officials must reassess past practices and take a more holistic approach to urban planning and water management, and the engineering industry must deliver the technical knowledge and skills to address important problems. "Droughts come and go," he says, "but effective long-term solutions can help us manage water without experiencing periodic crises." ■

Samuel Greengard is a technology writer based in West Linn, Ore.

Above: The Donner Summit Wastewater Treatment Plant, designed by Stantec, uses tertiary treatment with membrane bioreactors to filter and treat wastewater discharged into the South Yuba River. Below: The Silicon Valley Advanced Water Purification Center, located in northern San José, uses microfiltration, reverse osmosis and ultraviolet light to purify wastewater for industrial and agricultural uses.

AVOIDI

THE THREAT OF INTERNATIONAL CORRUPTION

By Gerry Donohue

JAMES LAURITZ/GETTY IMAGES

Corruption in overseas markets is endemic. Cases prosecuted under the Foreign Corrupt Practices Act (FCPA) by the Department of Justice (DOJ) and the Securities and Exchange Commission (SEC) have surged in recent years, with fines in 2014 totaling $1.56 billion and prison sentences for corner-office offenders becoming more common. Other nations have also begun to vigorously enforce their own anti-corruption laws.

Engineering firms can be especially vulnerable to corruption cases because the FCPA and similar laws in other countries focus broadly on illicit interactions with government officials. Firms with international projects often work closely with foreign officials, whether to win a contract bid or secure a permit. International engineering work is also often performed by teams that include firms from local nations, which raises the issue that different cultures can have differing perspectives on what constitutes corruption.

"Many of the largest enforcement cases under the FCPA have been in engineering and construction," says Mike Koehler, who is an assistant professor at Southern Illinois University School of Law and publishes the blog FCPAProfessor.com. "Seven of the top 10 FCPA fines had links to the sector."

In recent years, many firms operating overseas have developed comprehensive Anti-Bribery and Corruption (ABC) programs because they have learned that the consequences of slipping up are huge—and not just in terms of fines and jail sentences.

"Everyone accepts that a company will face tort liability, contract disputes or other legal claims from time to time," says Koehler. "But run afoul of the FCPA and you are immediately branded as a corrupt company."

Defining Corrupt Practices

President Jimmy Carter signed the FCPA into law in 1977 following a rash of high-profile bribery scandals involving major U.S. corporations, including Lockheed and Chiquita. The law makes it illegal for U.S. companies or foreign companies trading securities in the United States, including their employees or their agents, to make payments of any kind to foreign government officials to help obtain or retain business.

The U.S. was the first industrialized country to make corruption a crime through the passage of the FCPA, says Stanley Consultants Chairman Gregs Thomopulos. "This Act has done much in preventing U.S. companies from participating in corruption in the international market."

Both the DOJ and the SEC enforce the FCPA. The SEC is responsible for the companies it regulates, and the DOJ enforces the law for all the rest.

In the early years, the DOJ and SEC brought only a handful of cases each year—in some years, one or the other brought none—but in the past 10 years, the number of corporate and individual cases has jumped dramatically. In 2014, for example, the two agencies pursued more than two dozen enforcement actions combined, and at the end of the year, the French power company Alstom paid the largest-ever FCPA fine: $772 million for bribing officials in Indonesia, Saudi Arabia, Egypt and the Bahamas.

In 2010, the United Kingdom instituted the Bribery Act of 2010, under which any individual or company with links to the United Kingdom can be prosecuted for corrupt practices with foreign officials.

"The U.K. law is more stringent than the U.S. law and as a result has become the de facto base for firms operating in international markets," says David Nickols, who heads the London-based IT Power Group and has served in high-level international positions at Atkins, Black & Veatch and MWH Global.

The FCPA, for example, allows firms to give "grease payments" to foreign officials to expedite work they are bound to perform—as long as those payments are legal under local law—but the Bribery Act of 2010 doesn't permit payments of any kind.

Culture of Corruption

One of the challenges for U.S. firms operating internationally is that corruption—at least as the West defines it—is common in many markets.

"There are areas of the world where corruption is part of the cultural fabric," says Nick Masucci, chairman of Louis Berger, which does work in South America, Africa, Europe and Asia. "If you are in those markets, you need to enhance compliance oversight because you are going to encounter corruption."

"In India, for example, the only way to get a telephone line is to pay off an official," says Nickols. "If corruption is such an integral part of their normal life, it's not hard to make the leap to their professional life."

The most common agent for corruption in international markets is the third-party intermediary (TPI), which comes in many forms: expediter, sales agent, joint venture partner, accountant, lawyer, contractor or even subsidiary. In most cases, there is nothing untoward about the arrangement; in others, the TPI role is more nefarious.

"There needs to be zero tolerance for corruption, and the best way to combat corruption is a commitment at the highest levels of management that they will not pay bribes to win a project."

GREGS THOMOPULOS
STANLEY CONSULTANTS

Koehler estimates that "between 80 and 90 percent of all FCPA actions are due either in whole or in part to TPIs."

Internal Code of Conduct

The realities of the international marketplace prompted many firms doing overseas work to develop their own anti-corruption programs. Stanley Consultants—with its decades of international project success in countries such as Liberia, Malaysia and the Philippines—created its own integrity management program many years ago.

Henry Marquard, vice president and corporate counsel at Stanley Consultants, realized

With ACEC's Help, New FIDIC Guidelines Target Global Corruption

Adhering to its mission of promoting high standards of ethics and integrity among all worldwide infrastructure development stakeholders, the International Federation of Consulting Engineers (FIDIC) has established a new set of anti-corruption guidelines to protect the essential client-consultant relationship from being tainted.

The FIDIC Integrity Management System (FIMS) is a comprehensive guide for FIDIC members who represent consulting engineering associations from 97 nations, including ACEC in the U.S. FIMS establishes procedures for controlling and eliminating corruption by providing guidance on leadership, involvement of staff, adoption of a systems approach, documentation and training.

Henry Marquard, vice president and corporate counsel at Stanley Consultants, notes that several ACEC Member Firm leaders, in addition to members of ACEC's Legal Counsel Forum, provided valuable input in the development of the new FIDIC guidelines, which had been revised from a previous FIDIC anti-corruption policy. "The previous guidelines were developed by a lot of people from developing countries who were trying to solve a problem that at its core originates from developing countries," Marquard says.

Marquard became involved in developing FIMS when his company chairman Gregs Thomopulos was FIDIC president from 2009-2011. It was during Thomopulos' term that FIDIC undertook the major policy revision to simplify its use by Member Firms who could either adapt the anti-corruption guidelines or develop their own.

"For firms that have a high-level management commitment to integrity and ethics, FIMS has been helpful," Thomopulos says.

Jorge Diaz Padilla, CEO of Mexico-based SYSTEC, and also a former FIDIC president, said FIMS is based on zero tolerance toward bribery, extortion, coercion, fraud, collusion and conflict of interest. "FIDIC's approach to fight corruption and minimize integrity risks has been that of taking 'preventive actions,'" Padilla says.

FIDIC also seeks to persuade multilateral development banks to recognize FIMS compliance as a consideration for selection for bank-funded projects, and for clients to recognize those companies that have developed a FIMS as "reliable providers" and consequently warranting "preferential treatment." Padilla admits that such a "white list" has not yet gained the anticipated level of acceptance from many clients, who argue such practice would be "discriminatory" on its own.

"It is FIDIC's opinion that 'white lists' of firms would be much more useful than the 'black lists,' which are currently utilized," Padilla says.

Marquard believes the new FIMS will eventually set a standard in the fight against international corruption. "This is a very, very good document and a good starting point in what surely will be a long, tough fight against corruption," he says.

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Shahed Manzur, Ph.D., PE

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that in writing an ethics manual, a major component had to deal with the most vulnerable part of a firm's efforts in trying to adhere to anti-corruption guidelines—foreign agents. "Our ethics policy has form contracts and minimum standards for agreements specifically with foreign agents," Marquard says. "We then police it closely through project audits to make sure the agents are doing things exactly the way we want."

In the wake of a number of publicized legal proceedings involving the firm, Louis Berger embarked on a three-year, $25 million program to create a comprehensive global ABC program. "We believe that what we have now is, if not the best program in the world, definitely in the top tier," Masucci says.

A good ABC program has three main components: prevention, detection and enforcement.

Of the three, prevention is the most important, and a corporate commitment to ethical behavior is its most critical element. "You have to start with the leadership," says Nickols. "If the culture at the top is not to worry too much about corruption, then your people won't."

"We have a standard policy throughout the company that is founded on our culture and values," says Mariano Valle, senior vice president at T.Y. Lin International and director of the company's Caribbean and Latin American Division. "We expect ethical behavior from everybody within our staff and from the companies we work with."

Louis Berger's new 36-page Code of Business Conduct details the firm's expectations of its employees and provides a blueprint for how to avoid and prevent corrupt practices. Additionally, it lays out a process for employees who see corruption within the company to follow. All employees are required to be trained in the Code and to certify annually that they have read it.

"There are areas of the world where corruption is part of the cultural fabric. If you are in those markets, you need to enhance compliance oversight because you are going to encounter corruption."

NICK MASUCCI
LOUIS BERGER

When considering the vulnerability of engineering firms dealing with TPIs, T.Y. Lin International has its own cut-and-dried solution. "Our policy is not to use TPIs. That's the bottom line," says Valle. "We don't work with brokers or agents or anyone of that sort."

For companies without a blanket ban, there are several indications that a TPI may cause a problem. One of the most common is that the agent was formerly a government official.

"If someone has to be on your team in order for you to win the job," Masucci says, "you need to be very careful that they don't represent a compliance risk."

TPIs must be vetted very carefully, with their background and resume checked and researched to ensure they are legitimate. Many firms require that a senior executive at the home office make the final contracting decision, and some firms even require TPIs to participate in their compliance training program.

Unfortunately, says Nickols, it's not always that simple. "In some countries, it can be very difficult to lock them into a firm contract and a price that seems appropriate." In that instance, he says, "my preferred response is to walk away."

Detection and Enforcement

Every firm has safeguards in place to catch bad actors who are stealing from the company, but FCPA violations can be difficult for firms to detect.

"In a lot of these cases, you have people who are often quite low on the corporate ladder using corporate money—with no kickbacks—to help the corporation," says Koehler. "They think they're being a good employee."

Valle says a centralized accounting system, with all invoices coming into one office, can eliminate a lot of potential loopholes.

To detect a bribe, according to the accounting firm KPMG, firms should "look for insufficient or nonexistent descriptions of the transaction, lack of proper support and specious business rationales for the transaction. Special attention should be paid to supplemental, modified, or last-issued invoices and purchase orders because many times a bribe is solicited after the initial business dealing."

Additionally, bribes may be disguised as special payments, business introduction fees, rebates, inspection fees, charitable contributions, complex financing terms or even currency exchange calculations.

Survey of U.S. Businesses Operating Internationally

Do you anticipate the bribery and corruption risks to your company will increase, remain the same or decrease over the next two to three years?

Increase	51%
Remain the same	29%
Decrease	10%
Don't know/Not sure	10%

How effective do you believe your company's protocols and procedures are for monitoring compliance after a relationship begins?

Very Effective	9%
Effective	24%
Somewhat Effective	47%
Not Effective	13%
Not Answered	7%

Source: Kroll/Compliance Week 2015 Anti-Bribery and Corruption Benchmarking Report of 250 companies in a wide variety of industries operating in foreign markets

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In markets where firms have no choice but to make local disbursements in cash, says Masucci, "those need to be reconciled immediately, and you must require receipts for what the money was spent on."

Ideally, if the compliance program is in place and the detection policies and procedures are properly designed, there would be no need to enforce the rules because no one would break them.

"Run afoul of the FCPA and you are immediately branded as a corrupt company."

MIKE KOEHLER
SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF LAW

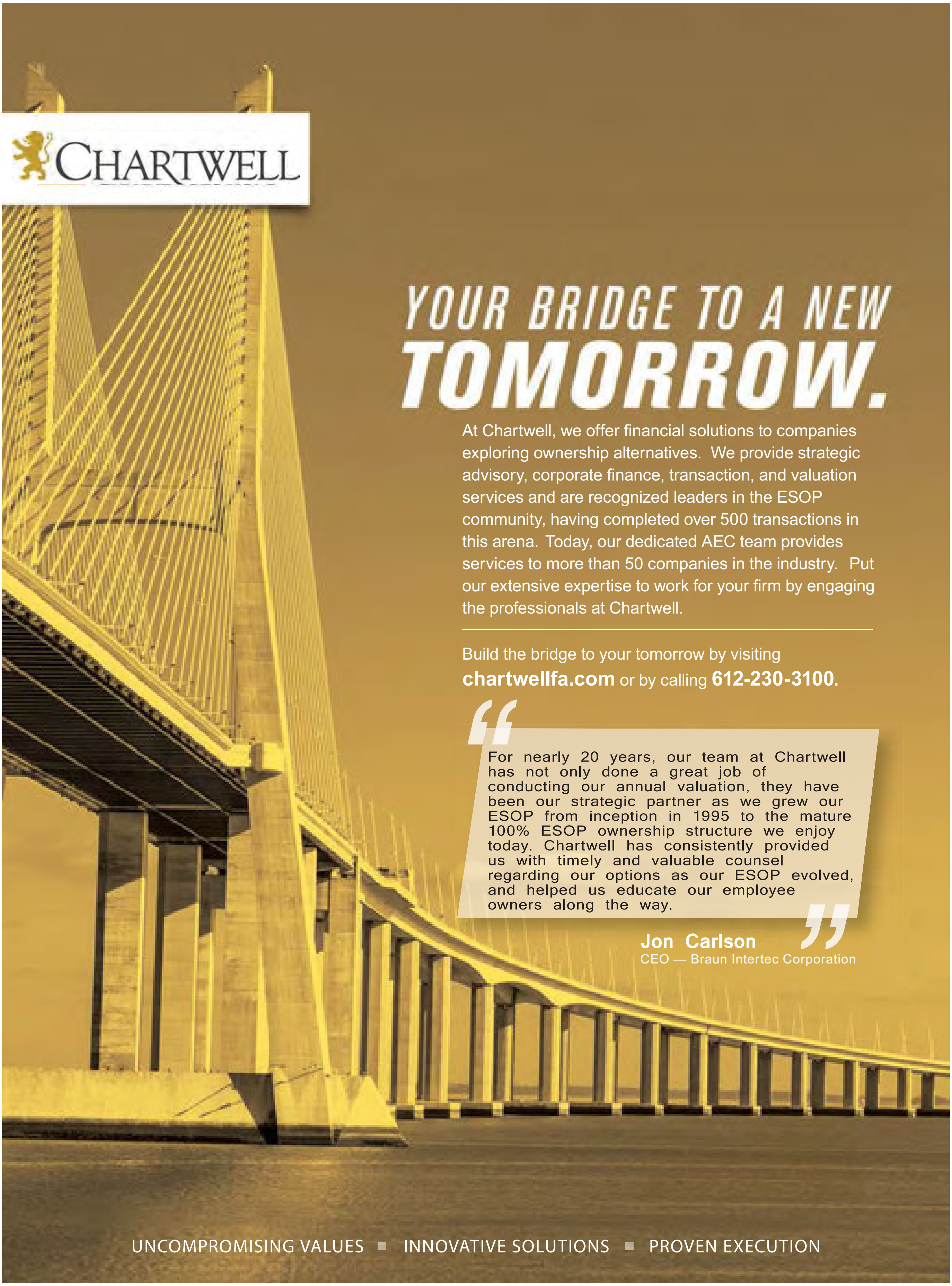
But, says Koehler, "that's not going to happen. You can be 99 percent successful, with proactive FCPA policies and procedures in which employees are trained and monitored, but you're still going to have people do something wrong."

For such an eventuality, companies must have a process in place for determining that a violation has taken place, setting the appropriate punishment within the company and self-reporting the incident to the appropriate enforcing government agency.

Thomopulos notes that there's still much to be done to combat corruption in the international marketplace. He pointed to how the World Bank has taken the lead with the other multilateral development banks in fighting corruption by debarring companies from participating in projects they finance.

"Fortunately, this problem is not as prevalent with U.S. firms as it is with other countries that we compete against for international projects," Thomopulos says. "There needs to be zero tolerance for corruption, and the best way to combat corruption is a commitment at the highest levels of management that they will not pay bribes to win a project." ■

Gerry Donohue is ACEC's senior communications writer. He can be reached at gdonohue@acec.org.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At Chartwell, we offer financial solutions to companies exploring ownership alternatives. We provide strategic advisory, corporate finance, transaction, and valuation services and are recognized leaders in the ESOP community, having completed over 500 transactions in this arena. Today, our dedicated AEC team provides services to more than 50 companies in the industry. Put our extensive expertise to work for your firm by engaging the professionals at Chartwell.
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chartwellfa.com or by calling 612-230-3100.
"For nearly 20 years, our team at Chartwell has not only done a great job of conducting our annual valuation, they have been our strategic partner as we grew our ESOP from inception in 1995 to the mature 100% ESOP ownership structure we enjoy today. Chartwell has consistently provided us with timely and valuable counsel regarding our options as our ESOP evolved, and helped us educate our employee owners along the way."
Jon Carlson
CEO — Braun Intertec Corporation
UNCOMPROMISING VALUES ■ INNOVATIVE SOLUTIONS ■ PROVEN EXECUTION

EMPLOYEE STOCK OWNERSHIP PLANS – THE PROS AND CONS

The number of Employee Stock Ownership Plans (ESOPs) has expanded greatly since they were formally established as qualified retirement plans in the U.S. in 1974. Today, there are approximately 7,000 active plans, with 13.5 million participants. ESOPs are found in publicly traded and closely held companies of every size, across every industry of the economy – in fact, ESOPs are particularly common in the AEC industry. It is no surprise why this retirement plan has gained popularity among business owners, management, and employees. For shareholders, ESOPs are a valuable liquidity mechanism that minimizes business disruptions. For employees and management, ESOP participation is a reward for years of dedication and hard work and an incentive for future business growth. Further, the benefits of ESOP ownership can be accomplished on a tax-advantaged basis.

WHAT IS AN ESOP?

An employee stock ownership plan allows employees to become beneficial owners of the stock in their company. ESOPs are defined contribution plans that primarily invest in employer stock, and are governed by the Employee Retirement Income Security Act (ERISA) of 1974. Since that initial legislation, Congress has passed a number of laws to encourage business owners to establish ESOPs. The intent of Congress was to create ownership and retirement assets for working-class Americans, an effort which has proven highly successful for more than 40 years.

ESOPs are trusts that acquire/hold/sell the company's stock for the benefit of participants in the ESOP, the employees. Typically, the company borrows money from lenders, investors, and/or selling shareholders, and then loans the ESOP trust funds for the purpose of acquiring shares. As the ESOP loan is paid down, shares are allocated to employee accounts annually, generally in proportion to the employee's annual compensation. Employees then receive cash in exchange for their shares upon retirement, termination, disability, or death.

AN EXIT STRATEGY

Today, many private business owners use ESOPs as their exit strategy. ESOPs are an excellent tool for succession planning, both for liquidity and transition. In addition to various tax benefits, ESOPs also allow business owners to reward their employees and managers with a stake in the business.

FLEXIBLE TRANSACTION

The flexibility of ESOP transactions allow owners to withdraw slowly over time or all at once, depending upon their needs. Owners can sell from 1% to 100% of their stock to the newly created ESOP. This makes it possible for an owner to remain active in the business even after selling all or most of the company.

In addition to flexible timing, the ESOP transaction process offers superior confidentiality relative to third-party sales. The private ESOP transaction does not require confidential information to be shared with prospective buyers (other than the professionals working on behalf of the ESOP), which could have a significant adverse impact on the business. While transaction terms and conditions are negotiated to ensure fairness to the ESOP and its participants, it is widely recognized that an ESOP transaction has a greater certainty of closing than a sale to a third-party.

CONTINUITY OF GOVERNANCE

Members of management retain their positions, allowing for a smooth transition when forming an ESOP. Shareholder confidence in management's ability to grow the business is critical in order to create the cash flow to pay off acquisition debt. Another advantage of a smooth transition is that long-term supplier, distributor, and customer relationships remain uninterrupted.

While other exit strategies can have a negative impact on company culture, the transition to employee ownership ensures the company culture remains intact or even strengthens, as the interests of owners, management, and employees are aligned.

Contrary to popular belief, employee ownership does not mean employees become more involved in day-to-day operations, governance, or strategic direction. There is no requirement to provide employees with financial or strategic information. However, ESOP participants are provided an ESOP summary plan description and annual statements of their ESOP account. In certain situations, employees are provided voting rights, many of which are specified in the plan document for the particular ESOP company.

EMPLOYEE OWNERSHIP – EMPLOYEE BENEFITS

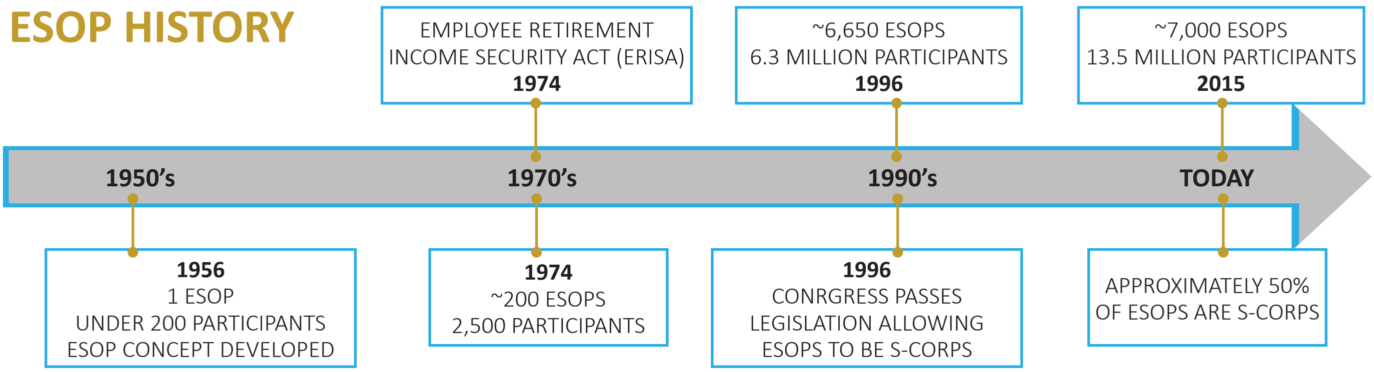
Being part of an ESOP company can provide unique rewards for employees. Participants in the plan can receive significant retirement benefits at no monetary cost to them. Research shows ESOP companies are more productive, faster growing, more profitable and have lower turnover – benefits that accrue to all stakeholders including the retirement accounts of the employee-owners. In addition, an ESOP is a great way to enhance the company's ability to recruit and retain top talent. Effective and ongoing employee communications to encourage employees to think and act like owners is necessary in order to generate these benefits.

THE TAX ADVANTAGES

The tax advantages associated with ESOPs can be significant for

"Over the years, we have found ESOPs to be a great fit with architecture and engineering firms. The structure is prevalent throughout the industry, but particularly among mid-sized firms. Many have utilized ESOPs to propel their growth, utilizing the tax benefits to acquire talent and maintain staff, resulting in dynamic work environments and significant financial benefits for employees. In addition, ESOPs fit well with the concept of building a legacy organization. In fact, a number of the most well-known and oldest firms in the architecture and engineering industry have successfully utilized this ownership structure, including Black & Veatch, Burns & McDonnell, Gensler, HNTB, and STV, to name a few." *-Chris Staloch, Chartwell Financial Advisory*

ESOP HISTORY



the selling shareholders AND for the company. For the selling shareholders, the primary tax benefit can only be realized if the ESOP is purchasing shares from a C corporation, through the utilization of section 1042 of the Internal Revenue Code, otherwise known as a "1042 rollover." In this circumstance, (assuming the ESOP owns more than 30% of the outstanding shares post-transaction), the selling shareholders have the ability to roll the proceeds from the sale of their shares into other investments tax free. This "rollover" serves as a deferral of capital gains taxes, allowing the shareholder to defer paying these taxes until ultimate liquidation of the rollover investment assets. However, there are limitations on the rollover investments and the advice of seasoned tax and investment professionals is critical in the utilization of this strategy.

The greater tax advantage is to the company. For all companies, payments made to the ESOP are tax deductible. In the case of a leveraged ESOP, payments are made to the ESOP to satisfy the debt incurred as part of the transaction. This means both the principal and interest payments made to a bank or selling shareholder provide a tax deduction to the corporation.

Furthermore, because the ESOP is a tax exempt trust, if the ESOP holds shares in an S corporation, the earnings attributable to the ESOP owned shares are not taxable. The ESOP must receive its portion of any tax distributions made to satisfy the tax obligations of any non-ESOP tax shareholders. However, the ESOP gets to keep its portion of the tax distribution to satisfy debt payments or repurchases of participant shares. Taken to its extreme, if the ESOP owns 100% of the S corporation shares, the company can forgo tax distributions and retain the cash in the company to reinvest in the business. Over time, this enhanced cash flow can provide a company with a significant competitive advantage, allowing for accelerated reduction of debt, greater capital investment / acquisitions, and enhanced employee benefits.

While there are many considerations a business owner must take into account before choosing to sell a business to an ESOP, it is safe to say the tax advantages and associated enhancement of cash flow of an ESOP owned company are compelling.

THE DISADVANTAGES

While the advantages of ESOPs are numerous, it is important to understand that an ESOP is not a good fit for every company or situation. Good candidates for an ESOP have strong management teams and generally produce consistent and predictable financial results. In addition, ESOPs fit best with selling shareholders interested in preserving the legacy of the company and rewarding management and employees with ownership. While ESOPs can pay a competitive price to the selling shareholders, the ESOP cannot pay a strategic premium for the shares it acquires.

When utilizing an ESOP as an exit strategy, the price that an ESOP can offer per share is limited to the fair market value of those shares. This price may be lower than what could be paid by a strategic buyer.

Once an ESOP is established, proper administration of the plan includes third party administration, valuation, trustee, legal costs. Business owners and management should be made aware of ongoing plan costs in the feasibility phase of ESOP planning. If the cash flow dedicated to the ESOP will greatly limit the cash available to reinvest in the business over the long-term, an ESOP is unlikely to be a good fit.

Long term planning for the sustainability of the ESOP and company is one of the most important considerations when implementing an ESOP. The company has an obligation to repurchase vested shares from ESOP participants who terminate employment. Therefore, careful cash flow planning should take into account the funds necessary to meet ESOP repurchase obligations. Without adequate planning, repurchase obligations can compete with other capital needs, thereby limiting the growth and potentially the viability of the company.

The ESOP only provides benefits to the participants if the underlying shares are determined to have value. Therefore, good management and operation of the business is critical to creating a successful ESOP company. The failure of an ESOP company can result in the employees losing their jobs as well as any value that may have accrued in their ESOP accounts. For this reason, it is widely recommended that companies offer retirement benefits in addition to the ESOP. A large percentage of companies that have an ESOP also maintain a 401(k) or profit sharing plan.

CONCLUSION

The benefits of an ESOP can be significant for selling shareholders, the management team, and the employees. However, the federal regulations governing ESOPs are complex and the cost of establishing and maintaining a plan may be greater than other types of retirement plans. As such, it is critical to consult with advisors who are knowledgeable about the legal, accounting, and administrative issues unique to ESOPs. Establishing and administering an ESOP can be complicated. However, with an ongoing focus on educating participants and guidance from seasoned professionals, the benefits of an ESOP normally far outweigh these complexities.

For more information, please contact:

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BARR Annual ESOP Valuation **Trustee Advisor**	BRAUN INTERTEC Annual ESOP Valuation **Trustee Advisor**	EA Engineering, Science, and Technology, Inc. Executive Compensation Consulting **Corporate Advisor**	JLG Sale of Company to ESOP **Corporate Advisor**
Kennedy/Jenks Consultants Annual ESOP Valuation **Trustee Advisor**	SEH Buy-side Transaction Consulting **Trustee Advisor**	WENCK Sustainability Consulting **Trustee Advisor**	Wunderlich-Malec Sale of Company to ESOP **Corporate Advisor**

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THURSDAY, OCTOBER 15

10:45am-12:00pm
"Mergers & Acquisitions: Challenges & Opportunities"
Panel Participants: *Gregg Spagnolo, AECOM; Richard Selim, Cardno; Eric Flicker, Pennoni; Bruce McNeilly, WSP Parsons Brinckerhoff*

1:45pm-3:00pm
"Leading Organizational Change to Improve Financial Performance"
Presented by: *June Jewell, AEC Business Solutions*

3:30pm-4:45pm
"CFO Roundtable: Open Discussion"
Panel Participants: *Chris Staloch, Chartwell; Bob Gabel, Haley Aldridge; Chris Nelson, McKim & Creed; Martin Mullins, Simpson Gumpertz & Heger*

FRIDAY, OCTOBER 16

9:15am-10:30am
"Exit Strategies in a Growing Economy"
Presented by: *Joe Skorczewski, Chartwell; Nick Belitz, Morrissey Goodale*

11:15am-12:30pm
"Engineering Compensation to Recruit, Retain, and Reward the Next Generation"
Presented by: *Katy Young, ExactSource; Alex Moss, Paxis Consulting Group*

3:00pm- 4:15pm
"Capital Market Trends"
Presented by: *Will Bloom, Chartwell; Panel of Experts*

UNCOMPROMISING VALUES ■ INNOVATIVE SOLUTIONS ■ PROVEN EXECUTION

LEADING THE WAY, LENDING A HAND

How Cardno's employee-driven campaigns benefit their communities

By Calvin Hennick

Most mornings, Brian Reilly, a senior consultant in the Natural Resources and Health Sciences Division of the global engineering firm Cardno, sets out from his home office in Seal Harbor, Maine, and bikes the 27-mile Park Loop Road around Acadia National Park.

Reilly used to cycle with his wife, Patti, on the crushed-rock carriage roads that crisscross the park, traveling through idyllic forest, past peaceful ponds, and under and over rustic stone bridges. »

Cardno employee Brian Reilly trains for "Pedal for Women in Science 300."

Cardno will match all funds raised by its employees participating in "Pedal For Women in Science 300."

Their relationship was cut tragically short in 2013 when Patti died in a car accident. "Patti enjoyed riding," Reilly recalls. "It was something we started doing together while dating and continued throughout our marriage."

Now, more than two years later, Reilly is using their shared interest in cycling to honor his wife's memory by raising funds for something else she was passionate about: encouraging women to pursue careers in science.

The event, named "Pedal For Women in Science 300," will kick off on October 12 in Half Moon Bay, Calif., with Reilly and a group of riders embarking on a six-day, 350-mile ride to Santa Barbara to raise money for three charities; Cardno is matching all donations.

The ride is the firm's latest corporate social responsibility effort, but far from its first. Worldwide, Cardno has 8,200 employees in more than 300 offices (including 240 in the U.S.), and most branches participate in several charitable endeavors each year. The firm favors efforts—such as this bike ride—that actively involve employees, as opposed to campaigns that merely require the company to write a check.

A number of offices participate in "Movember," for example, in which employees grow moustaches to raise awareness and money for men's health issues during the month of November. Others take part in "Canstruction," building elaborate structures out of canned goods, which are then donated to local food pantries.

"I think our employees genuinely want to give back, and they care about the communities that they live in," says Paul Gardiner, president of Cardno's Americas region. "People get really passionate, and they enjoy giving back to the community. It also helps us attract and retain the right people. People who have that value—who want to give back and do some good—are the type of people we want. And if we can help enable that, it's a good thing because we end up with a much happier workforce."

Women in Science

Reilly dreamed up the bike-ride fundraiser along with Wayne Kicklighter, a Cardno technical director who works from his home in West Virginia, when they were on a rafting and canoeing trip in Zimbabwe last year. They were discussing where to take their next vacation together, and after the idea of a multi-stage bike ride came up, they decided the ride should be for charity. At that point, raising money to support women in science was a natural choice. Patti Reilly was a Cardno ornithologist, and Kicklighter's wife is a biologist.

"It felt right to support women in science," Kicklighter says. "It was definitely something that is important within Reilly's family and within my family."

The cause aligns with Cardno's corporate values, as well. Several years ago, the company launched its "Women in Cardno" program, aimed at providing networking and career development opportunities for women in the company. Already, the program has resulted in a comprehensive analysis of gender pay gaps within the company.

Reilly and Kicklighter's ride, so far, has around a dozen committed riders, and another dozen are seriously considering participating. Cardno will match all funds raised, and the money will go to two American Association of University Women science programs, as well as a scholarship in memory of Patti Reilly.

Patti Reilly frequently spoke to young girls about career opportunities in the sciences, Brian Reilly recalls. He notes that women continue to be underrepresented in science and engineering and says that he enjoys working with women because of the "different perspective" they can provide. When the logo for the bike ride was being created, for example, Reilly initially preferred the dynamic image of a woman pedaling downhill. But a female colleague noted that women in science face an "uphill ride" and suggested that the image of a woman struggling upward might be more appropriate. "None of the men on the phone had thought of that," Reilly says.

Lori Stone, a Cardno scientist based in Okemos, Mich., who is participating in the ride, says she's had a "pretty great" experience as a woman working in the sciences. "I was hired to the company by a very strong, independent woman, and my role model in the company is a woman, too," she says. "Somehow, I've been able to find women in high roles to look out for me and guide me." Stone says she plans to tap into her competitive nature and "out-raise everybody" on the ride to help ensure that other women have similar opportunities.

"People who have that value—who want to give back and do some good—are the type of people we want."

PAUL GARDINER
CARDNO

Men's Health

Clients who meet with Cardno male staffers in the days after Halloween might notice a bit of fuzz on their upper lips. The engineers haven't simply gotten lazy about shaving. Instead, they're getting a start on the moustaches they'll grow throughout November to raise awareness and money for men's health issues, such as prostate and testicular cancer.

Gardiner first participated in the program in 2007, when he was diagnosed with colon cancer (he beat it and now has a clean bill of health). "The hair on my head was falling out, but I figured I could grow hair on my face," he says.

The Movember movement began in 2003 in Australia—where Cardno is headquartered and where Gardiner is from—and Gardiner brought the fundraiser to Cardno's American offices when he took on his current role in 2012. Last year, around 300 employees in about 20 of the company's U.S. offices took part, with the firm matching donations at the top three branches. But Gardiner, who usually opts to rock a "handlebar" moustache for the month, tends to raise considerably more than most of the other participants—he brought in around $7,000 of the Portland, Ore., office's $10,000 haul last year.

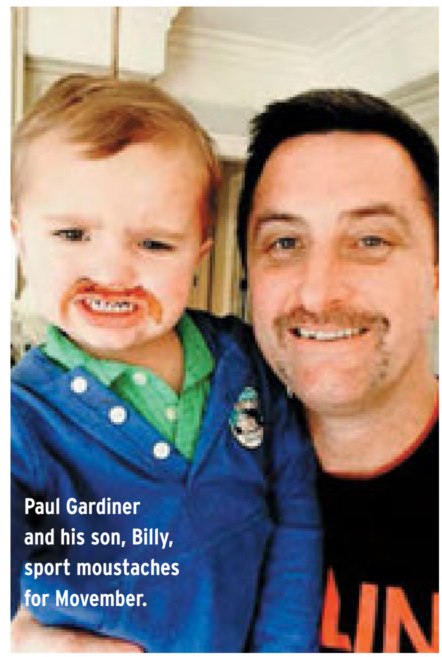
The handlebar moustache—not so out-of-place in the hipster haven of Portland, but unusual for an engineering executive, nonetheless—is a conversation starter, Gardiner says. In addition to helping him raise money, the facial hair gives him a reason to talk to men about the importance of being screened for cancer. Early detection is one reason he was able to overcome his own illness, he notes.

"It raises awareness," Gardiner says. "I tell people, 'You need to go and get things checked out.'"

In the last few weeks of October, Cardno tries to get as many employees as possible on board, with kickoff gatherings themed around mustachioed TV and movie characters, such as Ron Burgundy (played by Will Ferrell in the *Anchorman* movies) and Tom Selleck's Magnum, P.I.

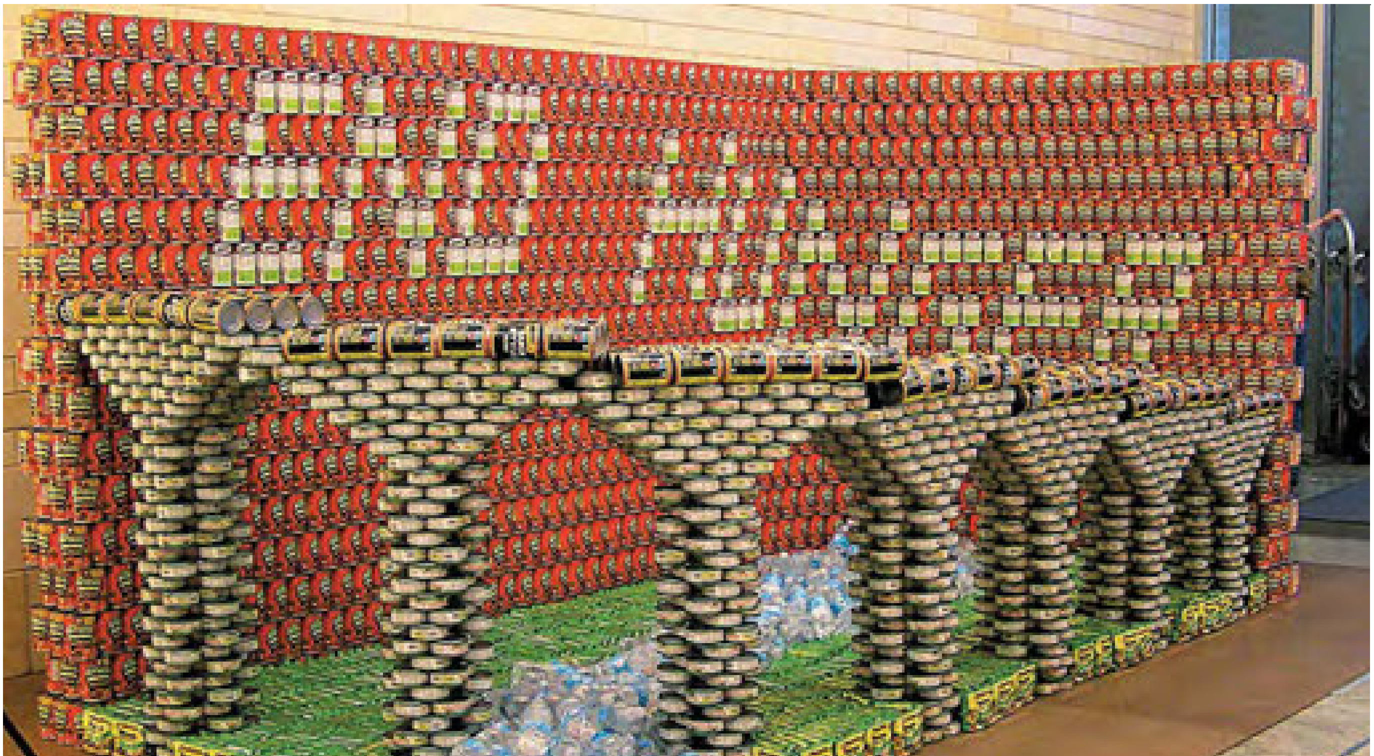
Although the program is more popular with men, the company playfully tells women they should "feel free" to grow facial hair during the month if they want to, says Kelly Johnson, a company spokeswoman who also works in the Portland office. Not surprisingly, most female participants opt to raise money and awareness instead. But the men seem to relish the opportunity to get a little scruffy for a good cause.

"I think it's kind of an excuse for them to grow the moustaches," Johnson says.



Paul Gardiner and his son, Billy, sport moustaches for Movember.

Cardno participates in Movember, an event in which employees grow moustaches to raise awareness and money for men's health issues.



Canstruction projects.

Feeding the Hungry

Tan Tran, an engineer at Cardno Haynes Whaley (a Cardno subsidiary located in Houston), spends most of his days working on mid- and high-rise buildings, such as schools, hospitals and residential towers. But every fall, he devotes a fair amount of time to figuring out how to work with cans of tuna fish and Chef Boyardee.

Tran is chairperson of the Houston office's community committee, and the branch is one of several Cardno offices across the U.S. that participates in "Canstruction." The international charity hosts competitions and exhibitions across the world that showcase structures made out of canned food, which is then donated to hunger relief organizations.

"We participate so that employees can give back to the community and have time to interact with each other outside the work environment—and have fun," Tran says.

"We have fun, but we do good things for the community, as well."

TAN TRAN
CARDNO HAYNES WHALEY

While the event may be a good time, Tran says his team takes its structures seriously, meeting biweekly during the fall to discuss designs. "We actually draw out the plans of where the cans should go and figure out how many cans of food we're going to need," Tran says, adding that the process isn't all that different from designing a real building. "You first have to know what you plan to build, and then you need to figure out what is needed and how it comes together. It involves a similar type of planning and execution."

In 2013, Tran's team built a "Bridge to End Hunger," which won third place in the Houston competition. The bridge's seven pillars were made of canned tuna, with a bottled-water river running through the grass (green-topped ramen noodle packages) below. Last year, the group constructed a ship, but even with the help of clear tape and thin construction boards to stabilize the vessel, part of the structure collapsed before judging.

All of that food adds up. The branch typically budgets $5,000 or more for the canned goods, all of which are donated to charity.

"We have fun," Tran says, "but we do good things for the community, as well." ■

Calvin Hennick is a business, technology and travel writer based in Milton, Mass.

BY PAT FEYEN

Affordable Care Act: Who It Helped and Hurt

The Patient Protection and Affordable Care Act (aka ACA or Obamacare) was signed into law on March 23, 2010. The first five years of the ACA have included a much-criticized website launch and multiple Supreme Court battles, but the primary experience for most Americans has simply been confusion.

The ACA doesn't just affect hospitals, doctors and insurance companies; it impacts every business in America, including architectural and engineering firms and the companies they serve. This review of the first five years of the ACA is intended to clear some of the fog and forecast what the next five years might hold.

This June, the Congressional Budget Office (CBO) released *The Budgetary and Economic Effects of Repealing the Affordable Care Act*, which includes the CBO's latest scoring of the financial impact of the ACA. According to the report, "repealing the ACA would increase federal budget deficits by $137 billion from 2016 to 2025." The same report shows that the ACA has added $1.658 trillion in new spending.

How can a law add this much new spending and still decrease the deficit? Let's say the ACA dug a hole of $1.658 trillion in new spending in the yard. According to the CBO, the total effect of the ACA is that there is no new hole in the yard but that there is actually $137 billion in dirt, or dollars, left over. Here's how the CBO gets there.

- The coverage expansion spending is offset by $502 billion in new taxes, fees and penalties that create revenue to help pay for the ACA.
- After accounting for the revenue sources, the net impact of the coverage expansion is a $1.156 trillion hole in the yard.
- The $1.156 trillion "hole" in the deficit is filled by spending cuts and new taxes and fees that are unrelated to the ACA health coverage provisions. Medicare was the primary source of spending cuts and new taxes.
- After filling the "hole" with Medicare savings, the surplus comes from new fees on health insurance companies, pharmaceutical manufacturers and medical device companies.

The ACA requires funds from nonrelated sources to cover the cost of the coverage expansion. The combination of Medicare cuts and new Medicare taxes is $1.148 trillion in "dirt" to fill in the ACA financial hole. Medicare reductions included in the ACA are projected to cut Medicare spending by $802 billion from 2016-2025. The report also shows that "high-income surtaxes" that were implemented as Medicare taxes through the ACA will generate $346 billion in additional government revenue. The net result is that the ACA created a $1.148 trillion swing in Medicare financing over the next decade.

The health insurance coverage expansions within the ACA were primarily financed through Medicare reimbursement cuts and Medicare taxes. Understanding this vital economic link also provides a window into how the ACA has affected primary health care stakeholders, from federal and state governments to hospitals and employers.

I assign a grade to how the ACA has impacted the various stakeholders. An "A" means it has been beneficial, and an "F" signifies a disastrous result.

Federal Government – Grade A+

The federal government was facing the financial tsunami of an aging baby boomer population, decreasing labor force participation, and health care inflation within Medicare that consistently outpaced revenues and the economy. The ACA dramatically reduced payments to hospitals, skilled nursing facilities and home health care providers; added new Medicare taxes; and linked the future funding of Medicare to growth in the GDP. The near-term impact has been negative net hospital inflation in Medicare since 2008.

The per beneficiary Medicare hospital insurance cost had reached $5,179 in 2008 and was projected to reach $6,734 by 2016. The latest Medicare estimate is that the 2016 cost will be $4,992.

The dramatic Medicare financing improvement through the Medicare reimbursement reductions and new taxes included in the ACA have significantly improved the federal government's finances.

State Governments – Grade B ... so far

The ACA's most significant impact on states has been the establishment of Exchanges. The Supreme Court overturned the ACA provision that forced states to expand Medicaid and gave states the power to determine whether or not to expand Medicaid eligibility according to the ACA rules. Through the ACA, the federal government covers 100 percent of the costs of Medicaid expansion for 2014 through 2016, with a scheduled reduction to 90 percent from 2020 forward. In spite of this financial incentive, 21 states have still not expanded Medicaid eligibility.

Many of the states that have resisted expansion are concerned that the federal government will not always honor its commitment to fund its share of the expansion costs.

Hospitals – Grade B

Hospitals have faced financing cuts through the ACA and through sequestration. The gap between what Medicare and what private insurance pay for hospital services has spread. According to the

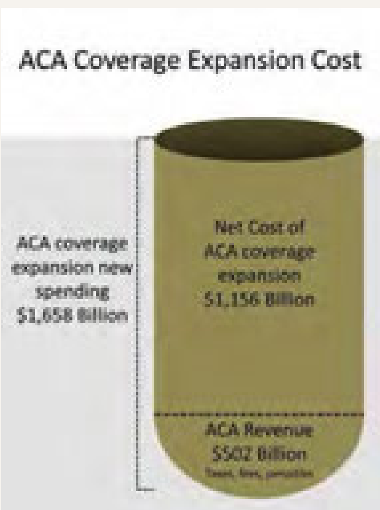
American Hospital Association, private insurance paid 44 percent more for services in 2010 than Medicare. This gap swelled to 85 percent by 2012.

Physicians – Grade A

The American Medical Association put its support behind the ACA in exchange for a commitment that the Medicare Sustainable Growth Rate (SGR) reimbursement formula would be repealed. SGR called for dramatic reductions in physician reimbursements based on the Balanced Budget Act of 1997 cuts. The cuts were never implemented, but the threat was a problem. SGR was officially repealed in April 2015.

Insured Americans – Grade C

The majority of Americans who had health insurance coverage when the ACA passed have experienced little benefit. Pre-existing condition limitations have been outlawed but were already outlawed in the case of insured individuals seeking renewals. Coverage for dependent children was extended to age 26, and annual plan maximums were eliminated. These features have benefited many Americans. However, private health insurance rates, required employee contributions, and plan design cost-sharing features, like deductibles, have continued to increase at significant rates. There has also been ever-increasing regulatory complexity.



Uninsured Americans – Grade B

The elimination of pre-existing condition limitations and all underwriting provisions has helped many Americans gain access to health insurance. The Medicaid eligibility expansion subsidies in the Exchange have helped make coverage affordable for millions of Americans. A recent government report showed that 87 percent of plan enrollees in the Exchange received a subsidy in 2014, and the average subsidy covered 72 percent of the total premium.

Small Employers – Grade C

Small employers, defined by the ACA as having fewer than 50 full-time employees, are exempted from ACA coverage requirements, but most have seen little benefit. The law's underwriting rules have compressed the premium rates between older and younger employees and employee groups. Employers with a younger population are subsidizing employers with older populations through the ACA's underwriting provisions. The heavily regulated underwriting market extends to companies with fewer than 100 full-time employees on January 1, 2016.

The ACA underwriting rules eliminate industry factors and claims experience as elements of insurance rate determination. These eliminations will potentially punish architects and engineers who have a younger workforce and better claims experience. These negatively impacted employers will likely look for solutions outside the regulated market through options such as an industry trust product or self-funding.

Large Employers – Grade D

Large employers are absorbing cost shifting from Medicare reductions, coverage and eligibility mandates, and burdensome administrative and regulatory requirements included in the ACA's more than 20,000 pages of regulations. The cost and administrative requirements have created skepticism among large employers.

According to ACEC's *Engineering Business Index*, 33 percent of Member Firm leaders said the ACA has resulted in significantly higher "per insured employee costs" since 2010, and 41 percent said they experienced "slightly higher costs." Additionally, a survey by the International Foundation of Employee Benefit Plans found that most employers hold negative views of the ACA. Although many employers are still unsure of the true impact, 10.6 percent felt the law has had a positive impact on their business while 54.1 percent believed the ACA has had a negative impact. When asked about the expected future impact, the number of employers with a negative view grew to 66 percent.

A Peek at the Future

The future of the health insurance marketplace will be greatly influenced by large employer actions. The financing of the American health care system is largely on the backs of large employers. Medicare has capped its inflation rate, but large employers enjoy no such luxury.

The federal government's driving force in health care financing is keeping Medicare, Medicaid and Exchange budgets in check as enrollment in all three programs expands dramatically over the next five years. The intensity of this focus leaves little sensitivity to the cost and complexity plight of large employers. At some point large employers will no longer be willing to absorb, or pass along to their employees, cost increases that are multiple times higher than growth in wages or the economy.

Rather than fighting against the government programs, the next five years will usher in a health care "missing link" in which private plan reimbursement and inflation rates are more closely aligned with the government programs.

The question is whether market reforms will lead us down the path or whether the private health insurance market will require regulatory intervention to initiate positive change. Stay tuned … the large employer's role in health care financing is not going away.

Pat Feyen is president of the ACEC Life/Health Trust. He can be reached at pat@aceclifehealthtrust.com.

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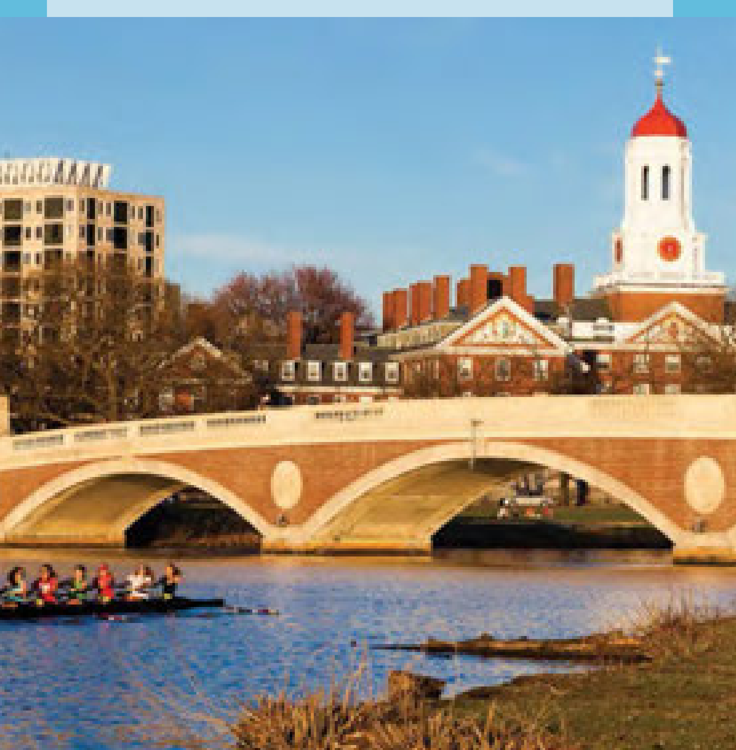
FEATURED SPEAKERS

Doris Kearns Goodwin
World-Renowned Author and Pulitzer Prize–Winning Presidential Historian will address:
"Leadership Lessons from the White House"



SOCIAL EVENTS

* Local Color Night Opening Reception - Welcome to Beantown - Featuring Boston's Irish Rock Band, "The Gobshites" (Included in Your Registration)
* Boston Tea Party Museum Tour & Reenactment
* "Bottoms Up" at the Sam Adams Brewery
* New England Whale Watch
* Historic Tour of Concord & Lexington
* Edward M. Kennedy Institute for the Senate and the John F. Kennedy Library Tour

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www.acec.org

CHANGE AND INNOVATION IN THE A/E INDUSTRY: PEOPLE AND PRACTICES THAT BUILD SUCCESS!

Dr. Robert Ballard
World-Famous Oceanic Explorer and Discoverer of the Titanic, will address:
"New Age of Exploration"
Ballard will also receive ACEC's Distinguished Award of Merit.

KEY BUSINESS TOPICS

Risk Management ... Workforce Challenges ... Alternative Delivery Systems ... Leadership & Strategic Planning ... Market Challenges & Opportunities ... Technology & Innovation ... Financing & Procurement

SESSION HIGHLIGHTS

CEO Panel - Change and Innovation in the A/E Industry

Stephen Hickox
Chairman & CEO, CDM Smith

Eric Keen
Engineering President/Vice Chair, HDR

Tom Scarangello
Chairman/CEO, Thornton Tomasetti

CEO Panel - People & Practices that Build Success

Lisa Brothers
President/CEO, Nitsch Engineering

Mike Carragher
President, VHB

Larry Smith
President/CEO, Haley & Aldrich

... and more than 30 Advanced Business Management Sessions for CEOs, CIOs, CFOs, Emerging Leaders, and other Industry Professionals.

BY DOUGLAS REED

Successful Firm Growth Starts With Cultivating Leadership

For most corporate leaders, growing their businesses is a perilous challenge. The landscape is littered with the corpses of once-successful firms that overextended or pursued badly flawed growth strategies.

There are two ways to grow a firm: acquisitions and organic growth.

Douglas Reed

When looking to expand their operations, many firms immediately seek out acquisitions. They often look for targets that are located in potentially lucrative geographic markets or that have a specialty they don't already have.

An acquisition is risky since a firm is essentially purchasing intellectual capital, as opposed to a manufacturing plant. Since these are people, not machines, many acquisitions fail or underperform because firms are not ready for the "people adaptation" needed. According to *Harvard Business Review*, 70 to 90 percent of acquisitions fail, and the people factor is a major cause.

Since the failure rate is so high, it is critical to first know whether acquisition thoughts are obscuring larger problems. If a firm cannot grow with its own resources, the red flag of failure is huge.

A firm I worked at for more than a decade spent 15 years gyrating between 75 and 200 employees. Along the way, the firm acquired five additional firms as a growth solution. All of those acquisitions failed and harmed the firm's reputation. Time spent on "fire drills" encumbered resources that might have been applied elsewhere. For example, one acquired firm had many design issues that were discovered following the acquisition. More than 1,000 hours were spent on damage control, and the liability insurance policy was paid out to its limit. The root cause of this was a poorly developed leadership team that was not patient enough to wait for a qualified acquisition candidate.

Firm leaders should always ask, "Has the firm been able to grow consistently without acquisitions at a rate far greater than the local market?" If not, why hasn't the firm been able to achieve significant growth with the staff and skills it has? Identify this barrier and overcome it before considering any kind of acquisition.

A Bigger Firm Means More Leaders

The key to a firm's successful growth starts with growing its leadership. Successful firms are led by visionary and self-confident leaders who value their staff, understand what the staff brings to the table and foster a staff's professional growth.

This can be particularly challenging in an engineering environment. Leaders typically began their careers as engineers and worked their way up the corporate ladder. While many go to business school to learn how to be more effective leaders, the vast majority learn as they go, imitating their superiors, who themselves are often not students of business science. This approach is limiting and doesn't necessarily foster excellence; it requires leaders to have natural leadership skills rather than providing an ongoing opportunity to develop them.

For firms to truly thrive, corporate leaders must be able to operate at the highest level of every aspect of firm management. Too many firms struggle because, while their leaders are excellent engineers, they have a difficult time handling balance sheets, developing marketing strategies or mentoring the next generation of leaders.

All too often, when managers struggle with marketing or with managing their staff or clients, they are told that they just need to work harder. Usually, though, it's a matter of working smarter. If a firm's leaders aren't operating at a higher level than their competitors, how can that firm expect to succeed?

SWOT Your Staff to Uncover Tomorrow's Leaders

It is not uncommon for savvy firm leaders to misread the business landscape. Many leaders are reading the tea leaves wrong, assuming their people are smarter than the competition and that, as a result, they will thrive in the recovering economy.

But how do they know their people are smarter? By gazing upon the engineers and managers who sit outside their offices? By reviewing the firm's designs and reveling in their excellence? By talking to clients and ascertaining that they are satisfied? You can't just declare your staff smarter or better than the competition and expect that declaration to bring success. Decisions need to be based on data.

The best way to derive that data is through a SWOT analysis—a formal review that measures each leader's and senior manager's strengths, weaknesses, opportunities and threats. Firm leaders are then able to make a realistic and objective assessment of the firm's ability to assimilate another firm and prosper or, if growth is organic, to rapidly hire new employees and remain focused on delivering services.

The methodology of a SWOT analysis is to populate the tables with an assessment of the firm's key influential leaders and managers, not of their technical skills. In comparing leaders to your

ANDY RYAN/GETTY IMAGES

competitor's equals, examine current peer firms as well as those at the next size threshold.

Technology makes it easier than ever to validate this data. Select three to five competitor firms, and use Google, the competitors' websites, LinkedIn and personal networking to gather intel on them. Combine this with a client survey, and you will have solid data to assess your team.

The data from the leadership SWOT analysis may be an eye-opener for many principals and CEOs. The results will lead to training and hiring as well as new systems of encouragement and rewards that position your firm for growth, whether organic or through acquisitions.

A SWOT analysis can also help an executive determine a firm's readiness for growth because it can specify the objective of the business venture and identify all the internal and external factors that are favorable and unfavorable to achieve that objective.

The Power of Leadership Investment

Of course, running a firm is time-consuming. Many leaders don't have the time to earn a business degree or attend outside seminars. But those leaders can bring in business consultants who are experienced in and skilled at business management, growth, pricing, recruiting and marketing—all critical to growing a professional services firm.

As future leaders are identified, they should be included in business seminars and provided follow-up support and coaching. Leadership development is a continual process.

Firms can't wait for management openings to start developing new leaders. They need to employ people able to step into place when needed. That means constantly evaluating staff to identify those with leadership skills and putting them on a management track by providing ongoing training on all the business practices they will be expected to oversee in the future.

It may sound simple, but this commitment to leadership growth and excellence requires a great deal of discipline. It's not enough to pay lip service to the concept of leadership investment; firms need to have formal programs in place that operate consistently. These programs can provide the expertise leaders need to operate at the highest level required for a firm's success.

Firms that make smart acquisitions, create and maintain a learning culture, and compare their leaders' SWOT to competitors will have a significant competitive advantage over firms that don't. These are the firms that will rise above the rest.

Douglas Reed, P.E., is president of FosterGrowth.biz, which helps CEOs and executives secure their future by fine-tuning their company's processes, culture and systems to achieve safe growth, increased profitability and a comfortable financial position. Reed can be reached at dreed@fostergrowth.biz. Learn more at blog.fostergrowth.biz.

BY ALLEN PREGER

Digital Technology for Enhanced Quality Management System Performance

Building information modeling, email, mobile computing and other technologies are flooding engineering firms with data. Unless it's managed well, that information runs the risk of derailing existing quality management systems.


Allen Preger

For example, thousands of two-dimensional construction drawings can be generated in minutes with Revit compared to the hours or days it took with CAD systems.

How are companies ensuring that revision management procedures keep up with this increased flow of sheet sets, especially since each revision is still a contract document that needs to be logged and quality-checked prior to issuance?

Quality management is critical to firms maintaining ISO 9001 credentials.

Michael O'Toole, an associate in the Building CAD/BIM Design Services group at WSP Global, is part of a team that audits quality control processes and trains groups to become ISO certified. Not content with legacy quality and risk management procedures that relied on manually maintained lists in spreadsheets, his team years ago adopted dedicated project information management software to manage meeting notes, drawing revisions and submittals.

"As far as the document controls we work with, we've come a long way, but I still think we're only scratching the surface on the possibilities," O'Toole says.

Such software offers potential for managing, tracking and logging project delivery processes. "We used to have about 20 procedures" for some quality systems, O'Toole says, but they cut down to nine by identifying unnecessary complexity.

New ISO 9001 standards going into effect in 2015 require even more risk management integration across a company's quality assurance/quality control (QA/QC) management systems.

Because ISO standards are by definition international (the letters come from "International Organization for Standardization"), American firms can get compliance ideas from offshore companies.

United Kingdom-based BDP, for instance, uses a dedicated project information management system to maintain its ISO 9001 certification. Alistair Kell, BDP's director of information and technology, explains: "Our standard project setup automatically generates 46 QA action items that link to the relevant BDP procedures." The 46 audit points include assignments and completion dates defined and monitored through BDP's project information management software.

Based on the same software, the firm's Project Handbook provides a quality control "health check" across all the firm's projects, with simple green, amber or red color-coding to signify QA compliance. "It's a live view that allows project directors to proactively address quality concerns before they turn critical," Kell says.

As for BIM quality management, Shive-Hattery, a U.S.-based architectural and engineering firm, uses a dedicated project information management system to manage Revit sheet sets. "We publish PDFs of our sheets and synchronize sheet information into the document control area of our software, so the drawing information is current and accurate as we prepare project deliverables," says Mitchell Kelchen, project delivery specialist at Shive-Hattery.

Kelchen gives an example of one way the system reduces the risk of overlooking a detail. "The software enables us to predefine lists of bid package recipients. It's a simple matter to generate a package of drawings from Revit and issue it to all the right people, without risk of someone being omitted."

The software-driven process improves quality while saving time. "What once took maybe 30 minutes now takes five," Kelchen says. "Across multiple teams, those time savings add up."

Shive-Hattery's project information management software links functions of the document quality control process, so there's no opportunity for tasks to slip through the cracks. "Our staff can quickly make adjustments to sheet and model information with more accuracy than managing multiple lists manually in separate software," Kelchen says.

The software also includes an app for viewing plans on iPads, which extends quality control into the field. Everyone is working from the latest versions.

Email is a prolific source of digital information, and BergerABAM President and CEO M. Lee Marsh wants to be sure his employees can quickly sift through thousands of emails to find answers.

"For many years our firm has been concerned that email could be a source of business risk if we were unable to find that one critical email that could resolve a dispute," Marsh says. "Now our project information management software provides a powerful tool that helps mitigate that risk."

Managed well, digital information contributes to more successful projects. But digital data also invites an information overload that can contribute to problems. As a result, engineering firms are responding by using digital technology to make their quality control and risk management systems more effective.

Allen Preger is a co-founder and vice president of global accounts for Newforma, a U.S.-based developer of software for building and infrastructure project information management. Follow Allen on Twitter @allenpreger or his posts on Newforma's blog at http://www.newforma.com/blog/.

Solutions for the A/E Industry

ACEC Coalitions' Best-Selling Publications

ACEC Coalitions are dedicated communities of ACEC members organized by practice area or firm size. Coalitions provide a wide range of practical, day-to-day resources, best practice guidance and knowledge-sharing opportunities that enhance business operations and make firms more profitable. Coalition publications help firms streamline their operations for greater efficiencies and profitability. Best sellers for 2015 are:

CAMEE

Quality Assurance/Quality Control Guidelines—The goals of a QA/QC program involve improving the quality of designs and documents, eliminating errors and omissions, and reducing unnecessary costs.

CASE

A Guideline Addressing Coordination and Completeness of Structural Construction Documents—The Structural Engineer of Record's goal should be to meet both the owner's and the contractor's needs by producing a complete and coordinated set of documents to minimize potential costly changes.

COPS

Health and Safety Manual—This updated health, safety and training manual provides a basic overview of fundamental field safety procedures and includes customizable sample forms and tailgate safety to help firms work smart and work safe.

LDC

Establishing Financial Controls for Successful Development Projects—Profit cannot be an option; it's required to achieve financial security.

All ACEC Coalition-developed publications are available at **www.acec.org/bookstore**.

On-Demand Webinar "10-Packs" Bring Convenience to Professional Development

Most states require licensed engineers and surveyors to earn professional development hours (PDHs) each year and file the credits with their state licensing boards. But for many professionals, the time and expense of a multiday training program is a challenge, especially when renewal deadlines approach.

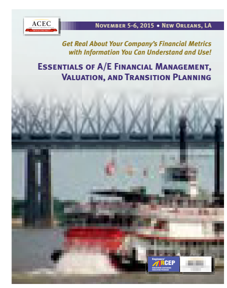
As a result, practitioners increasingly are turning to ACEC On-Demand Webinars to meet that challenge. On-Demand Webinars provide quality programming on critical engineering business management topics, allowing professionals to earn PDHs when and where they choose. The increasingly popular 10-pack option makes in-house continuing education immediate, accessible and cost-effective. Instead of paying $199 per individual webinar, the 10-pack rate delivers 10 webinars at just $140 per session—a $59 savings for each selection. With no expiration date, you can choose webinars on the fly, and subscriptions are completely transferable among staff and offices. Each 90-minute recording carries 1.5 PDHs (unless otherwise specified). Content areas include: Business Management and Quality; Finance and Economics; Human Resources; Marketing and New Business Development; Contracts and Risk Management; Leadership and Ethics; Project Management and Project Delivery; and Public Policy and Industry Issues.

For a complete listing of available topics, visit **www.acec.org/education/on_demand_search.cfm**.

Effective A/E Financial Management

Financials are the lifeblood of every business organization, yet too many A/E professionals don't understand how their company's financials work or the vital information they contain. Gaining knowledge and fluency with basic accounting tools is the key to sound decision-making—and growing a successful business.

ACEC's *Essentials of A/E Financial Management, Valuation and Transition Planning* program, to be held in New Orleans, Nov. 5–6, 2015, explores the impact that a still-volatile economy has on financial management beyond revenue, profits, backlog and staff size. Participants will learn how to extract and apply key financial measures, such as breakeven overhead rate, target billing multiplier and labor utilization percentage.



Attendees will also examine various performance, liquidity and leverage ratios, and how to benchmark these results with an eye toward shareholder value and the valuation's relationship to internal owner transition planning.

For more information, visit the ACEC Education website at **www.acec.org/education/seminars**.

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Members in the News

On The Move

Pasadena, Calif.-based **Jacobs Engineering Group Inc.**, named **Steven J. Demetriou** president and CEO. He succeeds former President and CEO **Craig Martin**, who retired in December 2014.

Cardno named **Richard Wankmuller** CEO and managing director. He most recently served as director of GHD Group Pty Limited and president of GHD Americas. He succeeds Michael Renshaw.

Hailey, Idaho-based **POWER Engineers, Inc.**, named **Bret Moffett** president and, effective in 2016, CEO. He succeeds **Jack Hand**, who will manage the company and serve on the board of directors during the leadership transition.

Boston-based **GEI Consultants, Inc.**, appointed its first woman chair, **Gillian M. Gregory**, who joined the firm in 1986 and was elected to the board in 2013. Gregory is a geotechnical engineer specializing in dam safety investigations and dam engineering.

Houston-based **Walter P Moore** appointed **Lee Slade** as the firm's fourth chairman. He succeeds former Chairman and CEO **Ray Messer**, who will lead the firm's strategic initiatives in the design-build market. Slade is a 39-year firm veteran and has been a member of the executive leadership team since 1993.

Nashville, Tenn.-based **Smith Seckman Reid, Inc.**, promoted **Steve Lane** to president and COO and **Susan Osterberg** to chief administrative officer. Lane, who currently serves as COO, succeeds **Rob Barrick** as president. Barrick, who served as president and CEO for 29 years, will continue as chairman and CEO. Lane was named an ACEC Fellow in 2011. Osterberg formerly served as vice president of human resources.

Boston-based **BSC Companies, Inc.**, the parent firm of BSC Group and Geonetics, appointed **David N. Hayes** president and CEO. Formerly the executive vice president, Hayes succeeds **Charles Kalauskas**, who has led the firm since 2012. Kalauskas assumes the role of chairman from **Richard Long**, a former president.

Langan Engineering & Environmental Services in Elmwood Park, N.J., named **Andrew J. Ciancia** chairman. He succeeds **George P. Kelley**, who has served as chairman since 2003. Ciancia is a former president of ACEC/NY and chair-elect of the ACEC Engineering Excellence Awards Committee.

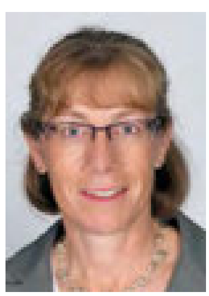
Amec Foster Wheeler appointed **George Hernandez** president of upstream business development and **Hannah Sesay** as global head of health, safety, security and environment (HSSE) and senior vice president, HSSE, for the Americas.

AECOM appointed **Heather Rim** senior vice president and chief communications officer. She is based at the firm's Los Angeles headquarters.

Broomfield, Colo.-based **MWH Global** promoted the following employees to senior vice president: **Paul DeKeyser**, director of global business development, based in Fairfax, Va.; **Paul Demit**, director of Americas program management, based in Atlanta; **Ben Emerson**, engineering design manager, based in London; **Norm Gadzinski**, director of government and infrastructure project delivery center, based in Cleveland; **Julie Labonte**, program consultant manager for the San Diego Pure Water Program, based in San Diego; and **Don Spiegel**, director of project delivery, based in Sacramento, Calif.

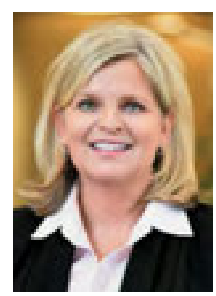

Richard Wankmuller


Bret Moffett


Gillian M. Gregory


Lee Slade


Steve Lane


Susan Osterberg


David N. Hayes


Andrew J. Ciancia


George Hernandez


Hannah Sesay


Heather Rim

Welcome New Member Firms

ACEC/Alabama
GeoCon Engineering & Materials Testing, Inc., Fairhope

ACEC/California
Akel Engineering Group, Inc., Fresno
Diamond West Engineering, Inc., Calabasas
Masson & Associates, Inc., Escondido
McGinnis Chen Associates, Inc., San Francisco
MEA Forensic Engineers & Scientists, Laguna Hills
SYRUSA Engineering, Inc., Brea

ACEC/Colorado
Pipeline Strategies & Integrity, LLC, Colorado Springs

ACEC/Connecticut
Milone & MacBroom, Inc., Cheshire

ACEC/Florida
Engineering Express, Deerfield Beach
Josephson Engineering Consultants, LLC, Tampa
Metco Services Southeast, LLC, Fort Lauderdale
Protean Design Group, Inc., Orlando

ACEC/Georgia
Croy Engineering, LLC, Marietta
Duplantis Design Group SE, LLC, Duluth
ERS Materials, LLC, Woodstock
Greencastle Engineering, Inc., Peachtree City
Wilburn Engineering, LLC, Newnan

ACEC/Kansas
Driggs Design Group, PA, Manhattan

ACEC/Louisiana
ECM Consultants, Inc., Metairie
Marrero, Couvillon & Associates, LLC, Baton Rouge
NTB Associates, Inc., Shreveport
OneSource, EHS, LLC, Gonzales

ACEC/Metro Washington
CES Consulting LLC, Chantilly, Va.
CSI Engineering, P.C., Laurel, Md.
John J. Christie & Associates, P.C., Silver Spring, Md.

ACEC/Michigan
AR Engineering, LLC, Kalamazoo

ACEC/New Jersey
LS Engineering Associates Corporation, Montville
MP Engineers, P.C., Princeton

ACEC/New York
AKRF, Inc., New York, N.Y.
Watson Engineering, P.C., Owego

ACEC/North Carolina
Accelerate Engineering, PLLC, Cary
Areté Engineers, Boone
CriTek Engineering Group, P.C., Greensboro
Jewell Engineering Consultants, P.C., Kernersville

ACEC/Ohio
Bird+Bull Engineers + Surveyors, Columbus
the jdi group, Inc., Maumee

ACEC/Oklahoma
Frontier Land Surveying, LLC, Edmond
Myers Engineering, Consulting Engineers, Inc., Oklahoma City

ACEC/Texas
American Engineering Consultants, LLC, Rockwall
Childress Engineers, Cleburne
HydroLink Engineering, Addison

ACEC/Utah
Brier Consulting, Sandy

100-Year-Old Member Firms

In the July/August issue of *Engineering Inc.*, the cover feature titled "Secrets of the Centenarians" highlighted ACEC Member Firms that have been in business for at least 100 years. Despite our widespread solicitation efforts, several firms were inadvertently omitted from receiving well-deserved recognition. They are:

SCHOEL ENGINEERING
Birmingham, Ala.
Founded: 1888

SARGENT & LUNDY
Chicago, Ill.
Founded: 1891

MODJESKI AND MASTERS
Mechanicsburg, Pa.
Founded: 1893

FREESE AND NICHOLS
Fort Worth, Texas
Founded: 1894

WILEY|WILSON
Lynchburg, Va.
Founded: 1901

WHITMAN, REQUARDT & ASSOCIATES
Baltimore, Md.
Founded: 1915

Calendar of Events

SEPTEMBER

16 Mature ESOPs: What Do We Do Now? (webinar)

23 Using Metrics to Identify Barriers to Success (webinar)

24 Ownership Transition 2.0 (webinar)

28-29 Human Resources Forum–2015, New Orleans

28-29 Information Technology Forum–2015, New Orleans

28-29 Finance Forum–2015, New Orleans

29 Placing Round Pegs into Round Holes: Supercharge Your Teams with Smarter Assignments (webinar)

OCTOBER

1 Strategy—It's Not Just a Vision Thing (webinar)

6 Capture Planning to Dramatically Increase Your Business Development Efficiency and Effectiveness (webinar)

14-17 ACEC Fall Conference, Boston

20 The Leadership Advantage—Producing Leaders from Within (webinar)

27 Be Memorable and Win More Work: The Difference-Makers for Winning Proposals (webinar)

29 Value: The A/E/C Industry's Biggest Blind Spot? (webinar)

NOVEMBER

3 Negotiating Better Engineering Contracts (webinar)

5-6 2015 Emerging Leaders Institute Session III, Port of Greater Baton Rouge

To sign up for ACEC online seminars, go to **www.acec.org/education**.

Additional information on all ACEC activities is available at www.acec.org.

BY NEIL CHURMAN

M&A Setting Record Pace in First Half of 2015

Deal making among industry firms continued to accelerate through the first six months of 2015, with 117 sales of U.S.-based A/E firms, up from 113 sales during the first six months of 2014. Sales of international firms also ticked up, with 53 sales of overseas firms as of June 30 versus 48 in the same period last year. Overall, global activity through the first six months increased nearly 6 percent.

The "megadeals" we saw in 2014 (such as AECOM acquiring URS) have tapered off, but firms continue to look to mergers and acquisitions (M&A) to enhance and fill gaps in their current service offerings.

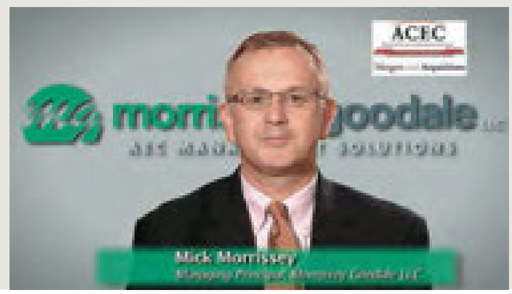
In many of the deals over the first half of 2015, buyers added niche capabilities, such as program management (PM) and owner's representation services, or expanded their geographic footprints. For example, in March, ACEC Member STV acquired Mass.-based Diversified Project Management, a provider of owner's PM services, while ACEC Member NV5 acquired two PM firms—Mass.-based Joslin, Lesser & Associates in February and San Francisco-based Mendoza & Associates in April.

According to Anatoly Darov, chair of the Design and Construction Practice Group at Burns & Levinson, "PM firms offer specialized expertise in managing capital facility projects, an area that has become much more complex and regulated over the past decade.

Engineering companies and commercial real estate firms, in particular, looking to expand client service offerings and gain expertise in capital program advisory, project controls and oversight, and risk management have been active in this space where consolidation historically has been limited. PM firms also offer access to lucrative institutional relationship clients and long-term program engagements."

Firms will likely continue to use M&A as they seek to capitalize on the strong U.S. market. The industry continues to consolidate at all levels, with mega firms combining and smaller firms making niche acquisitions. If the pace of deal making in the second half of the year matches the first, we'll see another record year for industry M&A.

- **To view the most up-to-date and "live" versions of the M&A heat maps, and to see the buyers and sellers in each state, go to www.morrisseygoodale.com.**
- **Watch the M&A Takeaway video that accompanies this article, presented by Mick Morrissey, at www.morrisseygoodale.com/ACECMergers/SeptOct2015.**
- **To see an infographic highlighting A/E/C M&A activity through the first half of 2015, visit www.morrisseygoodale.com/2015-Mid-Year-Review.html.**



Recent ACEC Deal-Makers

JULY 2015

ACEC Member **Wantman Group** (West Palm Beach, Fla.), a multidisciplinary consulting firm, acquired ACEC Member **Bridge Design Associates** (Royal Palm Beach, Fla.), which provides engineering services for buildings, bridges, ocean piers, marinas, docks, seawalls and pump stations.

ACEC Member **NV5** (Hollywood, Fla.) acquired **RBA Group** (Parsippany, N.J.), an infrastructure engineering firm that provides transportation engineering, construction inspection, environmental engineering, civil engineering, surveying and architecture services to public and private clients throughout the East Coast.

ACEC Member **Stantec** (Edmonton, Canada) acquired **VI Engineering** (Houston), a power and electrical engineering firm.

ACEC Member **Pennoni Associates** (Philadelphia) acquired the assets of **J2 Engineering** (Pensacola, Fla.), which provides environmental, engineering, construction management and design-build services.

CEI Architecture (Vancouver), one of western Canada's leading architectural practices, merged with ACEC Member **HDR** (Omaha, Neb.).

JUNE 2015

ACEC Member **Tighe & Bond** (Westfield, Mass.) acquired **Waterfront Engineers** (Stratham, N.H.), which provides specialized engineering services for shoreline challenges and waterfront facilities.

ACEC Member **Terracon Consultants** (Olathe, Kan.) acquired **AQS Environmental** (Omaha, Neb.), an air quality consulting firm with experience solving mold, asbestos, lead-based paint, indoor air quality and radon issues.

ACEC Member **H2M architects + engineers** (Melville, N.Y.) acquired **Riddick Associates** (Suffern, N.Y.), a civil engineering firm emphasizing water and wastewater disciplines.

ACEC Member **G2 Consulting Group** (Troy, Mich.) acquired **Schleede-Hampton Associates** (Birmingham, Mich.), specialists in geotechnical engineering services to the construction industry.

ACEC Member **WSP Global** (Montreal, Canada) acquired **Faveo Group** (Oslo, Norway) and **Levelton** (Richmond, Canada). Faveo provides project management services and associated specialist services in the areas of infrastructure and energy. Levelton offers engineering solutions in the areas of environment, geotechnical, building science, and materials engineering and testing.

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