

# The VOICE

The official magazine of The Construction Users Roundtable  
Summer 2007

## It's Time for Change

### LEAN Project Delivery: Eliminating Construction Waste

#### INSIDE:

- Crisis in Construction: HELP WANTED Re-cap
- Legal Brief: Is LEAN the Wave of the Future?
- ConsensusDOCS Transforms Industry
- BIM: The Good, The Bad and The In-Between
- Immigration: Help or Hindrance?

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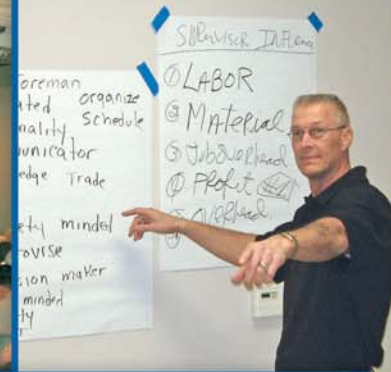
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## On the Cover:

North American companies are tightening their belts—so to speak—implementing LEAN Project Delivery with profitable results. It's crucial for survival, say industry leaders like Sutter Health and General Motors. Find out why on page 14.



## CURT LEADERS:

- 9** Ricardo Aparicio, Esq., CURT President
- 11** Graham Douglas, CURT National Conference Chairperson
- 13** Gregory Sizemore, Esq., CURT Executive Vice President

## COVER STORY:

- 14** It's Time for Change  
*LEAN Project Delivery: Eliminating Construction Waste*

## FEATURE:

- 20** A Crisis in Construction: HELP WANTED

## LEGAL BRIEF:

- 24** LEAN Project Delivery...The Wave of the Future?

## PROFILE:

- 29** American Electric Power

## GET TO KNOW CURT:

- 31** Membership Information
- 33** Publications
- 34** CURT Comments

## CURT INITIATIVES:

- 41** The 2007 CURT National Conference
- 42** ConsensusDOCS Transforms Traditional Contracts
- 43** 3XPT Workshop Propels Partnership to the Next Level
- 44** Hurricane Affected LUCs Never Doubt Rebuilding

## BACK AT YOU:

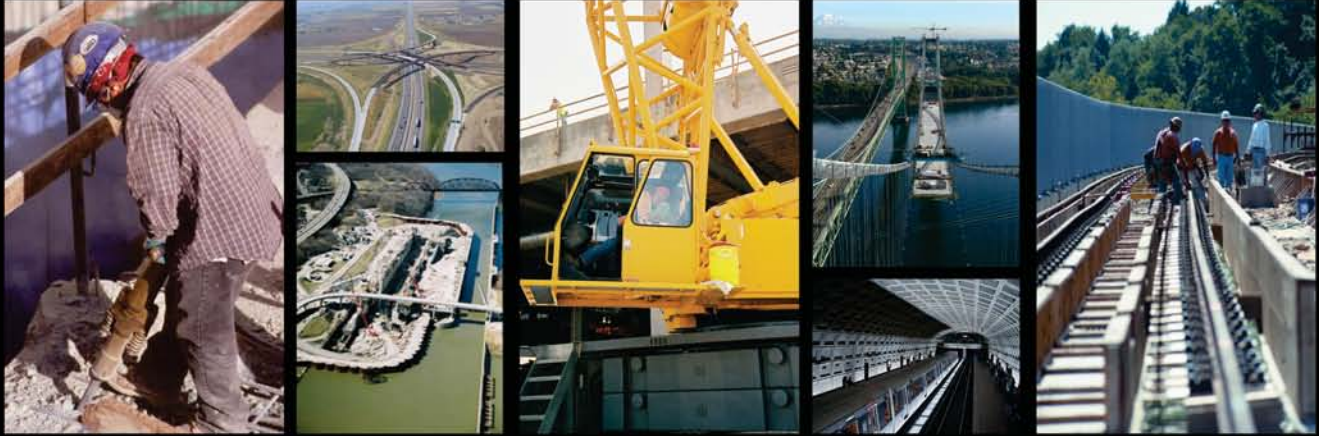
- 45** Building Information Modeling  
*It's Your Obligation as a Professional/ Better, Worse or Just Different?*
- 47** Can Immigration Solve the Workforce Crisis?

## 50 BUYER'S GUIDE

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I have to admit it. I am a latecomer to the LEAN construction bandwagon. Nothing provoked a quicker trip to the closest bar or a quiet exit stage right, than being approached by a LEAN construction disciple at a dinner reception eager to find a new convert in me. *Me culpa, me culpa, mea maxima culpa!*

The way I saw it back then, there was very little—if anything—that the manufacturing industry had to offer the construction industry. Manufacturing is defined generally as the application of tools and a processing methodology to the transformation of raw materials into finished goods. By and large, it is a controlled process, under controlled conditions, yielding large quantities of the same product over time with identical characteristics and quality. Today the processes are highly automated and the workforce that is generally employed in a particular production line is relatively stable. More importantly for both the consumers and the producers, costs and schedules are fairly predictable.

Construction, on the other hand, is none of that. It consists of the assembly of diverse components, including manufactured products as well as raw materials, in situ, under mostly unpredictable and uncontrolled conditions, to yield a unique asset with a group of participants that more likely than not, have never worked together before. Somehow, at the end, everyone hopes that the quality, cost and schedule will meet expectations. Too often, it does not.

So, given these fundamental differences, what would manufacturing concepts such as Six Sigma

and LEAN Sigma, have to contribute to the enchantingly chaotic world in which we elect to live out our collective lives?

As many owners, contractors and design professionals, it has taken me awhile to understand the concept and its applicability to our industry. Yet, simply stated, LEAN Sigma is nothing more than the systematic application of analytical tools to cut out waste from the manufacturing process. LEAN construction, in turn, is the transformation and adaptation of those analytical and improvement tools to

the design and construction processes in order to achieve the same result. I believe that we can all agree that there is plenty of waste in the design and construction industry that can and should be taken out.

In order to do so, however, we must rethink not only our processes but the very essence of the business models that we currently use. As the old adage goes, too often we repeat the same mistake, expecting different results.

Luckily, initiatives such as BIM, 3XPT, Collaborative Practice, workforce development and others are merging together with LEAN construction to redefine our business models and find ways to intro-

duce efficiencies and process innovation into our industry. The key for the stakeholders is to work together towards the same common goal. This is by no means an easy task. It will take an effort and commitment from all of us to get it done—even if it means foregoing the temptation of a quick trip to the nearest bar.

Ricardo Aparicio, AIA, Esq.  
General Electric Company  
CURT President

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## From Collaboration to World Class Execution: Solutions for Today's Construction Industry

Are you looking for cutting edge solutions and valuable networking opportunities to help solve the ever increasing challenges facing our industry? If yes, then mark your calendars for the 2007 CURT National Conference in Naples, FL, November 5-7, at the stunning Naples Grande Resort.

The 2006 conference saw record attendance and was highly acclaimed by attendees. Now the National Conference Planning Committee is hard at work to deliver another outstanding and thought provoking conference, building on the successes of last year.

But we cannot afford to rest on our laurels. Shareholders, customers and the financial world expect continuous improvement and flawless execution in an ever changing, competitive national and international market. Owners cannot rely on our industry partners to drive change and move us into the 21st century. For too long construction productivity has languished waiting for a champion to take the helm and provide the winds of change.

As owners, we must come to the realization that the solution lies within our power and is in fact, our responsibility. We must move our industry up the value stream. The good news is that CURT is keenly aware of the leadership role owners must take and is proactively addressing key areas that will provide timely and effective solutions which owners can begin using today to improve the bottom line. It is important to remember that no single solution exists. Workforce, safety, technology, process transformation, lean; clearly owners must use a combination of these tools to hit a target that is moving and evolving, making success that much more challenging to achieve.

To this end, the array of outstanding topics and premier speakers at the two and a half day event are lining up to provide the best conference yet. It will also allow for invaluable time to network with peers, sponsors and exhibitors. The various CURT subcommittees are developing topics for breakout sessions

that are sure to offer timely examples and key 'take-aways' that will once again demonstrate the value of this premier industry conference.

Join other owners, contractors and labor leaders as we take a deep dive into the processes, experiences and technologies that will drive improved performance across all aspects of your business. The industry continues to be challenged by a broad spectrum of issues and customers expect all of us to be progressive thinkers developing and implementing solutions. How do we take evolving tools and technology such as LEAN and BIM and use them to address workforce shortages, resource constraints, and challenging cost and schedule commitments? Who is taking the lead? How did they get started? What can others do to start the journey? Find out from those already pioneering change in their organization.

CURT members are committed to improving the industry and leading changes vital for our collective success in the areas of safety, quality, workforce development, technology, education and project management. The

National Conference will emphasize present and future direction to support success as we commit to driving change across the industry. We cannot be satisfied with allowing others to take the lead. We must be agents of change, driving behaviors and practices that will begin to transform the construction industry today and into the future. But no one can do it alone. Unlike any other time in recent history, we must collaborate, communicate and exchange solutions in this challenging market—join us, it's not too late!

The agenda continues to be developed. Send your ideas or examples that demonstrate breakthrough thinking to myself or the CURT office.

Doug Graham  
The Boeing Company  
CURT National Conference Chair Person

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## Outstanding Leadership Delivers Solutions

Jim Collins, author of “From Good to Great” once said, “Associations are the hidden glue of society and economy. Like mortar that holds the bricks of a building in place, associations go largely unnoticed, yet they do much to hold the entire structure together.”

He further commented, “Disciplined people who engage in disciplined thought and who take disciplined action—separates any great institution from the average.”

While I’ve never met Jim Collins, and doubt seriously whether he has ever heard of CURT, his assessment of success clearly describes our leadership team as they deal with some of the industry’s most daunting problems, not the least of which is a critical workforce shortage. It pervades every industry sector and nearly every area of North America. So what has our outstanding leadership team been doing to address the shortage? Let’s take a look.

This issue of The VOICE highlights the worker shortage and juxtaposes it with a very uncharacteristic relative—LEAN Project Management. On first glance you may wonder what the two have in common and why CURT is aggressively addressing these apparently different issues at the same time, along with other peculiar cousins like Safety and 3XPT. The fact is, this worker shortage is actually fuel for CURT’s interest in LEAN and other related CURT initiatives.

As impending workforce shortages loom on the horizon, owners are compelled to ask some very basic questions. Can the owner afford to wait for the rest of the industry to respond to the workforce need? Do we really need all those workers on our sites anyway? Are there alternative strategies that will alleviate this problem in the short-term and drive productivity in the long-term? These are the disciplined questions that a disciplined leadership team is tackling at CURT.

As a result, initiatives such as LEAN Project Delivery, 3XPT Strategy Group and our CURT Process Transformation Committee, along with aggressive recruitment, training and retention policies promoted by our CURT Workforce Development Committee, are all working together simultaneously to meet the needs of the owner community. In addition, new approaches using modularization, pre-assembly and off shoring are being studied and presented at workshops, seminars and conferences. And that’s not all.

A continual effort to improve safety performance will also have a positive impact on worker productivity and performance. Therefore, the CURT Safety Committee is committed to total quality improvement through recognizing outstanding safety performance through its Construction Industry Safety Excellence Awards Program and Owner Safety Blueprint.

In this issue, The VOICE editorial board has elected to highlight the worker shortage along with the LEAN initiative, which is designed to save owners money, reduce waste and improve productivity. This initiative, along with the many others at CURT, will have a positive impact on improving the tight labor force as well as improve cost effectiveness.

Disciplined people who engage in disciplined thought and who take disciplined action—separates any great institution from the average. As CURT strives for greatness in our industry, we applaud our leadership team and hope you glean insight into our effort to address the worker shortage, improve productivity and create a better working environment for everyone.

Gregory Sizemore, Esq.  
CURT, Executive Vice President

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# It's Time for Change

## LEAN Project Delivery: Eliminating Construction Waste

Three years ago David Long, the Sutter Health Facility Planning and Development Management, and staff stood in front of 250 members of the A&E community and declared from that point on, Sutter Health would deliver all projects using LEAN principles. Jaws dropped, eyes rolled and comments of, "Have you lost your minds?" filtered back to Long, who is a Program Manager in Facilities Planning and Development at Sutter Health. They were on a mission, though—to change the way they did business in order to do better business.

And they have, with enviable results.

LEAN is not a new concept. In fact, the theory originated in the 1950s, in an entirely different industry. When Toyota founder Sakichi Toyoda and his son Kiichiro came to the United States, they spent time observing Henry Ford's assembly line. What they saw was over-production and inefficiency, and so they strived to develop a better way.

With that goal in mind, the Toyota Production System (TPS) was created. Able to greatly reduce lead-time and costs, while improving quality, Toyota has used TPS to its advantage, climbing the ladder to become one of the ten largest companies in the world and the most profitable of all car companies.

While many other vehicle manufacturers have sputtered in the past few years, Toyota is expected to rev their profits (by the end of their business year, March 2008) well past \$200 billion.

Earnings like these are impossible to ignore. That's why, with dollar signs in their eyes, some of today's most recognized companies have adopted LEAN practices with the prospect of creating a safer, more productive work environment, while at the same time cutting project costs significantly.

"It's a growing movement," comments Greg Howell, co-founder of the nonprofit Lean Construction Institute, established to reform the way projects are designed, engineered and constructed. "It has already made a significant impact in Europe and South America. Now the practice is being accepted in the United States."

Cynthia C.Y. Tsao, an Assistant Professor at the University of Cincinnati's Department of Civil and Environmental Engineering who has been researching LEAN Project Delivery since 1997 agrees with Howell that the movement will, with time, transform how business in the construction industry is done. "The companies that first tested these principles are 'innovators' because they embarked on the

journey knowing only what researchers told them. Once these 'innovators' produced encouraging results, the next generation of 'early adopters' helped researchers further test different principles and techniques to improve our understanding of LEAN Project Delivery. Now that the 'early adopters' have also generated positive results, the 'early majority' can begin to capitalize on the principles and techniques that have proven to be beneficial."

Try to imagine a project that is completed on or before deadline and is millions under budget. Think not? Think again, says Howell. This is exactly what LEAN Project Delivery can do.

Howell attributes LEAN's recent arrival to the United States to three factors. One, the current way of doing things just isn't working. Two, companies are experiencing success applying the principles and practices, and are then sharing these success stories with others. Three, with legitimacy comes success, meaning more people come to understand what it actually is and how it can work for them.

"Creating a new mindset among all sectors of the construction industry is a major goal right now," says Howell. "This is, quite literally, a conceptual revolution that leads to new practices."

### CURT's Key Agents of Change

- **Education** is key;
- There needs to be a **shift** in everyone's way of **thinking**;
- LEAN targets the **best workforce**, forms solid **relationships** and builds **trust**;
- Owner's must be the **agents of change** and must **demand change**; and
- LEAN must become the **new culture** of the industry.

## How Sutter does it better

Based out of Sacramento California, Sutter Health is one of the nation's leading not-for-profit networks of community-based health care providers, delivering high-quality care in more than 100 Northern California communities. In 2004 the company's leaders decided to step out of the box, implementing a policy which required its contractors and subcontractors to use LEAN techniques on the nearly \$6 billion in capital projects that were scheduled for the next eight years.

Sutter Health is one of the largest companies in the nation to adopt LEAN Project Delivery and it has proved, over time, to be a successful venture. "We're seeing projects finish on time and on budget—or early and under budget—as well as without any legal claims and without burning out our staff," says David Long.

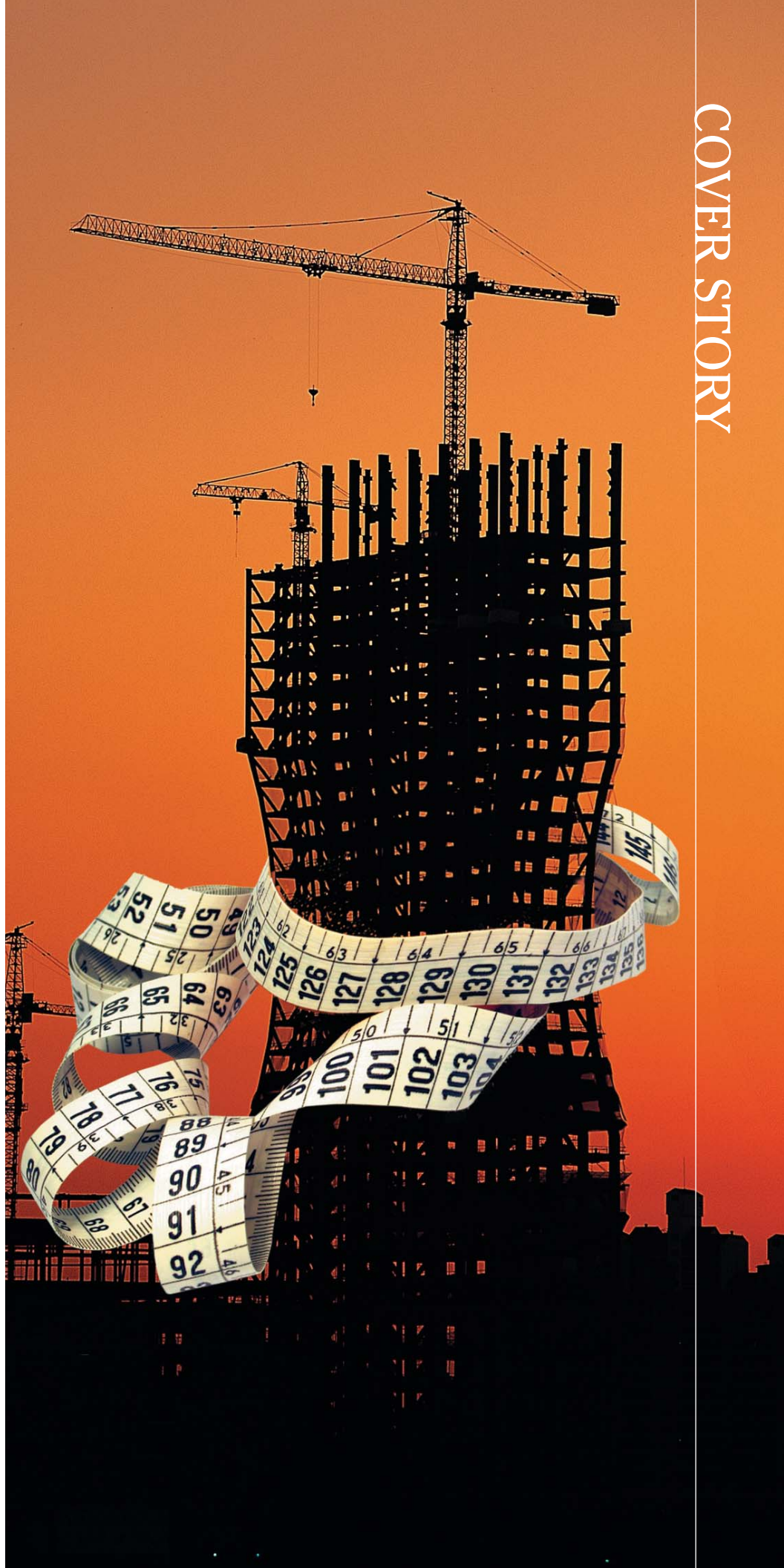
For Long, hearing the question "why would you do this?" is predictable. "Everyone wants to know why," he says. "The answer is relatively simple. The company was faced with a history of challenged projects. Going over budget and finishing behind schedule was the norm."

When the state of California passed Senate Bill 1953, which mandated that hospitals must meet stronger safety standards, Sutter decided that the best course of action was to bulldoze existing facilities and build new. This meant millions in new construction and the opportunity to revolutionize the system.

"Sutter, along with guidance from Lean Project Consulting, came up with Five Big Ideas, which we believe provides the cornerstone for how we conduct business," explains Long.

They are summarized below:

1. Collaborate; really collaborate, throughout design, planning and execution.
2. Increase relatedness among all project participants.



# ON RUBY INTEROPERABILITY

**CONSTRUCTABILITY** "When doing the pricing on a recent project, Douglas Steel Fabricating Corporation asked us to review the job to enhance constructability. It was a community college project that originally called for fully welded moment connections and knee-braced frames. The number of pieces and amount of field welding made the project uneconomical. Douglas Steel sent us the original design documents. We put together an alternative design that satisfied the intents of the owner and architect. We then transferred our CIS/2-

*DAVID I. RUBY, P.E., S.E., Structural Engineer. Principal, Ruby & Associates P.C., in Farmington Hills, Michigan. Specializing in steel designs that speed and ease constructability. Recently consulted on a community college project where his design and use of Interoperability resulted in a hyper-fast and efficient design—and a six-figure rebate from the fabricator to the school.*



***INTEROPERABILITY** is the ability to manage and communicate electronic product and project data between collaborating firms. It allows the exchange and management of electronic information, where individuals and systems are able to identify, access, and integrate information across multiple systems. The goal of interoperability is to create greater efficiencies by eliminating the manual reentry of data, duplication of business functions, and the continued reliance on paper-based information management systems. The steel design and construction industry uses the CIMSteel (CIS/2) neutral file format to enable interoperability.*

compliant model back to Douglas Steel, enabling them to process the model in SDS/2 so they could bid both the original and alternative designs on time. Without CIS/2 Interoperability — or what used to be called Electronic Data Interchange — we couldn't have turned it around fast enough to keep the job on schedule."

**VALUE** "The architect's drawings, the site constraints, points of access, equipment — there are so many different things to consider to come up with the most economical product that meets a client's needs. A lot of people talk about value engineering. What that really means is examining a set of decisions that have already been made, and going from there. You're talking inside the envelope. But when you design for constructability and value, outside-the-envelope thinking leads to things like speed to market and achieving budgets. CIS/2 Interoperability is a tool that lets us think like this."

**EFFICIENCY** "For the community college, the floor beams were spaced at about 3-foot, center-to-center, with a very light metal deck and a reasonably thin slab. As a rough count, we eliminated over 700 members, as well as 11,000 shear studs from the floor system and it was designed so everything could be field bolted. We ended up with a metal deck system and a thicker slab that added a little dead load to the structure, but increased the strength of the composite beams. Basically, we made it easier to build, stronger and much more economical. Plus, we stayed on schedule because the design only took four days thanks to CIS/2 Interoperability."

**PERSPECTIVE** "Working with Fazlur Khan to design the Hancock Building early in my career gave me a different feel for construction. One thing about the Hancock: the steel out-raced concrete to the roof. In fact, steel was 25 floors ahead at one point! We even had to design temporary braces to keep the structure together because we were so far ahead. Faz was such a great concept engineer. I learned you can't just look at a building as a design — it has to be built too! Piece by piece, stability is an issue during construction. But once it's done, the issue goes away and you let the building act as it should."

**COMMUNICATION** "The advantage of Interoperability is speed through the elimination of paperwork and many layers of communication. Typically, a detailer

would verbalize a problem to the fabricator who would submit a request for information to the contractor who'd send it to the architect. A response from the structural engineer would be communicated through the contractor to the fabricator and ultimately, back to the detailer. And many times the detailer would respond, "That's not the question I asked." This happens time and time again when you're trying to explain a three-dimensional problem in 50 words or less. CIS/2 Interoperability means the pertinent decision-makers — the engineer, detailer and fabricator — can look at the model in real-time, discuss the problem and collaborate on a solution. Better, faster communication is the value of Interoperability."

**INTERACTION** "With Interoperability, I work with the fabricator and detailer directly. We receive their files over the Internet, pull them into our system, make comments and send them back in just a couple of hours. This saves a tremendous amount of time and keeps us on schedule. Let's say there's a connection issue, or perhaps the fabricator has a question. We're not waiting because the drawings are in the mail. They just send us their three-dimensional models and we solve the problem today. That's what Interoperability is all about."

**UNIVERSAL** "The files a fabricator works on are generated from the RAM model we send them. So when they pull our models into the system for detailing, they have the most current designs. There is less paperwork to keep track of and that's a significant advantage. If I send files at noon, by 3 o'clock the fabricator has his bill of materials. Manually, this process took a week. And we're not talking just 40 hours — but two or three people putting in 40 hours to pull that all together. Those extra hours are an expense completely eliminated due to Interoperability."

**INTEROPERABILITY** "The primary reason for Interoperability is to integrate design and construction processes by eliminating the need for manual re-entry of data. The advantage for steel is that the CIS/2 standard enables compliant software—Tekla, SDS/2, Bentley, RAM, FabTrol and others—to exchange data electronically with accuracy and speed. In fact, CIS/2 makes most structural steel design, detailing and manufacturing applications interoperable."

**STEEL** "Steel already gave us a much quicker delivery time. And that's now clearly enhanced by CIS/2 Interoperability. Steel lets me build a structure that can be modified, easily reinforced, adapted to another use and has overall economy from start to finish. Unless you're building sidewalks, there's never a reason not to use steel."



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## It's Time for Change Continued from 15

3. Projects are networks of commitments.
4. Optimizing the project not the pieces.
5. Tightly couple action with learning.

"This structure really changes everything," comments Long. "It increases the trust of project participants, exposes breakdowns in the system earlier and increases transparency. There are no hidden agendas. What's best for the project is best for everyone."

### Owners the key to implementation

While the bulk of LEAN practices need to be implemented at the contractor level, many believe it is owners who will drive that implementation by hiring only those who follow its standards.

However, right now only a handful of CURT members are using LEAN Project Delivery, according to Cynthia C.Y. Tsao. She completed an internal CURT Survey (of CURT owner and contractor members) on LEAN in March 2007, which she presented at the CURT Workshop on LEAN Project Delivery in April (see sidebar on page 18).

Enticing more owners to jump on board is one way to propel the shift toward its implementation. For Sutter Health, savings of just 10 percent can translate into millions—enough to finance even more hospitals.

While tantalizing for Sutter, pushing the idea of LEAN to their contractors took more effort. Long likens the process to climbing a mountain: "Initially we had contractors who stepped off the side of the mountain. They didn't like the path we were taking so they chose to break ties and go their own way. Now they're realizing that they might as well cooperate because being tethered to us on the side of that mountain is a good business decision."

In the end, that survival instinct is the ultimate driving force behind LEAN. That's why for Howell, the question "why bother" has such an easy answer. "Do or die. The industry is changing and you must adapt. There is no other way to survive."

## An Owner's Experience

For Jack Hallman, Global Director of Capital Projects Organization for General Motors Worldwide Facilities Group, demanding LEAN Project Delivery from contractors is one step that owners must take in an effort to bring LEAN techniques to the mainstream. "We have to make it clear that we, as owners, have certain expectations and that if they, as contractors, can't meet them, then we won't give them our business. The reality is that eventually, those that don't change will go out of business."

For Hallman, tough love is the only way to change the culture of the construction industry, which in his opinion, is in need of repair. He says that identifying and eliminating waste (non-value added practices) throughout the entire construction stage is the only fix. Hence, LEAN Project Delivery. It has worked for General Motors (GM) and is proving to work for others. For GM in particular, there has been a noticeable improvement since implementing LEAN practices in 2004, including lower costs, shorter construction cycles, and increased production, safety and product quality. Hallman points to specifics including the fact that they've experienced as much as a 20 percent reduction in the time it takes to complete a project.

In an industry where time is money, that 20 percent translates into significant savings. Bob Beaker, Engineering Group Manager for Capital Projects for General Motors Worldwide Facilities Group, says that it's all about demanding things are right, from the very beginning. "What we need to do is say, here is what we're doing. Here is when we need it. Here is where it's needed. Now make it happen." Right now, he notes that items are delivered when they're ready versus when they're actually needed.

Change is in the air though, says Hallman. Although, for his liking it is a little slow in coming. That is why the owners have to be "agents of change"—similar to when they demanded improvements in safety some years ago. Without owners driving the change, safety would have remained a backseat issue—necessitated only when a contractor *felt like it*. Now most major corporations have very detailed safety plans in place, striving for zero accidents in the workplace.

LEAN Project Delivery can follow the same path of success, if owners are willing to use the tools available to them, says Hallman. One such tool that GM has employed is 3-D design. However in this case, he explains, it is more of a process than a technology. "We all work together to create one detailed master design. This allows us to coordinate everyone's separate jobs into one very efficient process."

In the past, the contractor who arrived first on site would do what was easiest for him. Then, when a second contractor would arrive, he'd have to work around the initial job. Then the third would have to work around the first two, and so on. This would inevitably mean interferences with each other's work and corrections being done on the job site. By planning ahead, GM has eliminated all those interferences.

"Even if it means more work for the first contractor, if it optimizes the job site for the second, third and fourth contractor, then it's worth the extra effort in the beginning," says Beaker.

But, without a strong push towards its implementation, LEAN may be left waiting in the wings. "Owner's must demand change," says Hallman. "They must modify the expectations they have of their contractors and the way they operate. LEAN must become the new culture of our industry. It's the only way to move forward."



## LEAN Changes Everything

In April 2007, industry experts and companies who have successfully implemented LEAN practices met in Phoenix, AZ, for a CURT Workshop on LEAN Project Delivery. The workshop evolved out of requests from CURT member companies who wanted to learn more about the concept and how it applies to their specific work structure settings.

The goal of the workshop was to increase LEAN Project Delivery awareness and to set the stage for CURT to proceed on the LEAN journey at an accelerated pace. As Joe P. Gionfriddo, Co-Chairman of CURT's LEAN Construction Committee

says, "CURT owner companies see that the industry needs to increase innovation, creativity and thinking. The workshop provided live testimonials from teams that have applied LEAN concepts, so that our members can see how they can do it too."

Gionfriddo brought together some of the industry's leading experts, including David Pixley and David Long, both from Sutter Health, who discussed Sutter's success with LEAN; Paul Reiser from the Boldt Company who outlined the evolution towards LEAN Project Delivery; and a distinguished panel of experts who debated topics such as owner's expectations and 3-D model integration.

Education is the key, believes Gionfriddo. That is why he felt a workshop like the one in Phoenix was invaluable. However, it can't start and stop with one workshop, he says, urging owners to

keep on learning. "Get out and attend more seminars or forums. Get on the Internet where there are plenty of reading materials and articles. Start the journey! Get out and begin applying a LEAN Project Delivery Tool."

Above all, Gionfriddo urges everyone to shift their way of thinking. "You have to look at the process through different glasses. LEAN thinking drives and strives to target the best work force. It pursues companies that want to form more than a onetime relationship. It grows around building trust, commitment and integrated contracting agreements that create a win-win situation for both the owner and contractors involved. Similar to when owners demanded safe construction sites, now we need to accelerate LEAN. We do not have 20 years, yet there is no step-by-step cook book. It is a true journey"

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*Solutions. This is what owners, senior executives, design firms and suppliers hoped to find in New Orleans—the setting of one of the largest workforce shortages in the United States. And they did. Panelists from some of North America’s largest organizations sat in front of a captivated audience, sharing their stories of halted projects due to a lack of skilled labor. Moving beyond the problem, these panelists also shared strategies that their companies and organizations have employed, with success, to alleviate the strain on their projects and, in turn, the industry. Help is wanted. Solutions have been found.*

Even under a mask of darkness, New Orleans cannot hide the fact that it is a city in disrepair. From the vantage point of an airplane, the overwhelming lack of lights below seems uncharacteristic for a city known for music, dance, festivities and celebration. It is, however, to be expected. At the turn of this century, the 2000 U.S. Census documented the population of New Orleans to be 484,674. Post-Katrina, that number dwindled to 255,000—just over half of its pre-hurricane count (U.S. Census Bureau, April 2007).

Hurricane Katrina, which raged through the Gulf Coast in late August 2005, missed the city itself. However, the storm surge that followed caused major levee breaches, precipitating the worst engineering disaster in U.S. history. By August 31, 80 percent of New Orleans was flooded, with some parts under 15 feet of water. All of the city’s levees were breached, including the 17th Street Canal levee, the Industrial Canal levee and the London Avenue Canal floodwall.

Images from the events that ensued are etched in most American’s minds: people stranded on rooftops, homes swept away in a flood of water and debris, looting and crime.

Now, almost two years later, the water has receded. What is left is a city in need of workers to rebuild homes and infrastructure. What is reality, though, is the serious lack of any such workers.

That is why Keynote Speaker Dr. Edward Blakely, the Executive Director of Recovery Management for the City of New Orleans issued a challenge to the industry, during his speech. “Our challenge,” he explained, “is not to just rebuild a city. Our challenge here is to rebuild a city into one that will be viewed

by the rest of the world as a great American city. But we need your help.”

The simple truth, he continued, is that, “If we can’t rebuild the workforce here, then we can’t rebuild the city.”

This need is one of the reasons why New Orleans was a fitting setting for the Construction Business Forum, *Crisis in Construction: HELP WANTED*, jointly hosted by the Construction Users Roundtable (CURT) and McGraw-Hill Construction. Over 300 industry leaders, some who are experiencing shortages, some who foresee shortages and some who offered their company’s solutions, met in early June to discuss trends, innovations and business issues—all related to the workforce crisis.

### **How bad is it?**

In June 2004 CURT published a white paper (WP-401 Confronting the Skilled Workforce Shortage) which looked at the shortages CURT members were already experiencing. As Steven Satrom, Vice President of Engineering Energy Businesses for Air Products & Chemicals, Inc., explained to the audience during the panel session *How Bad is it? How Bad Can it Get?*, “We looked at reasonable actions that owners could

# **Crisis in Construction: HELP WANTED**



take and developed a multi-pronged approach."

Key **musts** for owners included:

1. Recognizing the necessity of investing in training.
2. Establishing the expectations in the areas of workforce training and development, workforce recruitment, and worker retention.
3. Only doing business with contractors who invest in training and maintain the skills of their workforce.
4. Making contractor commitment to craft training a factor in the prequalification process, requiring in contract documents:
  - a. A description of the contractors overall company training program.
  - b. Details on investments made in training.
  - c. Information on any specific training planned for the proposed project.
  - d. Specific methods to evaluate skill proficiencies, such as skills assessment testing.
  - e. Evidence of support for the continued updating and improvement of apprenticeship training and journeyman upgrade training in the union sector.

When Katrina struck one year later, the fact that many owners didn't take action when the paper was first published exasperated the problem.

"Katrina brought everything to a head," said Richard Gill, Executive Vice President, Chairman of the Executive Committee and Interim President of the Power Group, The Shaw Group, Inc. "I've seen a lot in the past 40 years but I've never seen it like this before. This is a world-wide problem. There are different aspects of it—different degrees of shortages—but almost everyone is experiencing it to some extent."

The U.S. Department of Labor, according to the McGraw-Hill Report, *Key Trends in Construction, 2006*, estimates that one million new jobs will be added to the construction industry by

## Tangible Results

Forget the sun and the sand. High school students at Ft. Walton Beach Florida's **Community High: Okaloosa Institutes for Career Education** are spending their time making the CHOICE to build a solid future, preparing themselves to transition into a career in the trades.

CHOICE gives junior and senior high school students an alternative to regular classroom study. Participants spend three periods a day for 180 days each year soaking up all they can learn in a selected discipline. There are three different fields: AutoDesk design for students interested in architecture or engineering; construction management for those aiming to become project managers, construction superintendents and field engineers; and construction trades for potential master carpenters, electricians, plumbers or welders.

As the Institutes Dean, Matt Clark explains, "It's not a quick-fix. CHOICE is a solution." He continues, "Students are trained to use the latest software and technology for design and estimating. Most of what we do is hands-on and the results have been incredible."

So far, approximately 600 students have participated in the construction institute, with about 60 percent of graduates continuing their studies at a technical school, community college or university. While not all decide to stay in the industry, Clark eagerly points out that those who do clearly become passionate about the field. "They are focused and goal oriented. They want to have a career in construction and when they leave here, we've opened the doors that make that possible."

It is young workers, like the graduates from CHOICE, who are the future of the industry. And it is programs like it—one of many innovative training solutions discussed at the forum—that provide tangible solutions to a very real problem.

*CHOICE is just one of the many successful programs highlighted during the forum. Stay tuned to future issues of The Voice for stories on the others.*

2012. But the question begs, who will fill those positions?

Mark Fields, Global Category Manager-Americas, Shell Oil Company doesn't know. He's spent over two decades in the industry, talking to and working with contractors. Recently, he says, "I get the feeling that they're all fishing out of the same empty pond. There's just isn't the same workforce available out there, that we were once used to." In response to the current shortage, Fields says that Shell Oil Company approached their contractors and asked specifically what they could do to help. After all, he points out, "It's not a contractor-only thing. We're all affected."

"I've seen this before," reiterates Gill. "I've seen this before and I've seen the industry work through it." But, he cautions, "It's going to be painful."

## Owners with answers

So, what do owner's really think? Gerald Sprentall, CSC Construction Manager, Intel Corporation, Inc., and the CURT Workforce Committee Co-Chair tried to find out while moderating the panel, *What Owners Really Think*. A summary is below:

**Q Why is it important for DuPont to develop strategies to mitigate the workforce shortage?**

**A** *Ed Allison, Site Engineering Manager, DuPont Company*

As a science company, our mission is to put the science to work. In order to do that, we have to build safe, high quality and cost effective facilities. To accomplish this, we require a skilled workforce that can deliver the

quality and safety that we require. We believe that quality and safety are the building blocks of a skilled workforce, but that won't be achievable if we do not have the required people.

It's very important for us, as a company, to make that happen. It has to be done collectively though—fixing the problem is not something one company can do alone. Therefore, we have to collaborate and work with all the stakeholders to accomplish this goal. In addition, just as one owner cannot fix the problem, one solution will not fit all. That's why we encourage people at our locations throughout the United States to become involved in Local User Councils [LUCs] so they can get an understanding of the problems specific to each area. We strongly encourage other owners to do the same.

We are also trying to fit our smaller projects in between the huge projects going on at other companies and, recently, we have explored breaking our projects into smaller packages so that the contractors working on them can be assured of the duration and scope, and therefore reduce the risk and uncertainty.

## Q How does the current workforce labor capabilities influence project positioning and planning decisions?

A *Mark Fields, Global Category Manager-Americas, Shell Oil Company*

When looking at a potential project, we have to look not only at availability but also at the quality of the craftspeople, other project schedules, increased costs of materials and longer material lead-times. That is why, as owners, it is important for us to work closely with our contractors to ensure such availability.

One thing where the workforce really affects us is in turn-arounds. It used to be "let's just have one contractor who can take care of everything". Now we're looking at breaking it (turn-arounds) down, into lots of different groups and getting several different contractors involved so we have lots of different options and back-up, if we need it.

We also look at key performance indicators (KPI's). It is beneficial to meet with our contractors on a regular basis to ensure alignment and frequent communication, so KPI's—whether it's outlined in the contract or not—forces the owner to ask what their contractors are doing to meet their needs. We

then check back periodically to ensure that everything is in alignment; that they understand our project requirements and that we understand what they need from us in order to get things done.

## Q What considerations of construction workforce development strategies are visible at your company?

A *Joseph Sprys, Manager, Project Planning & Administration World Wide Facilities Group, Capital Projects, General Motors*

We're somewhat unique in this regard as we haven't experienced a tremendous shortage as of yet. As I say that though, it doesn't take much to look at the age of the existing workforce and the situation now and realize that we should expect some issues in the future.

We have various things we do, including requiring training. The CURT Whitepaper [WP-401 Confronting the Skilled Workforce Shortage] talks about requiring contractors to invest in training for their employees. This is something we try to do. We require our contractors to bring us a trained, ready-to-work, workforce to get our construction projects done. However, we are now asking them to provide additional safety training, and knowledge of LEAN construction, BIM and 3-D design, and so forth, which requires additional training. Implementing this strategy has gone a long way for us.

At General Motors we also work on a tripartite relationship between the union trades, the contractors on site and us, as owners. Collaboration is very important and works tremendously for us.

Flying out of New Orleans, again under a mask of darkness, didn't give passengers a glimpse of the damage still visible below. Maybe though, discussing not just the workforce crisis but solid solutions as well, will propel the industry to take action so that in the years to come, visitors to the city see a rebirth of the music, dance, festivities and celebration that had made this city so famous around the world. ●

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# LEAN Project Delivery... The Wave of the Future?

By Joseph A. Cleves, Jr.

Whether your experience comes from the client, builder or professional side, you have probably seen first-hand the challenges facing the construction industry. Owners commonly complain about timeliness, high cost and substandard performance. Architects, builders, subcontractors, and other players are often insufficiently coordinated to deliver the finished product within budget and on time. Safety is also a huge concern.

## Toyota's innovative approach

To address these issues, a number of builders are embracing LEAN Project Delivery, a new construction management model inspired by the Toyota Production System (TPS). TPS focuses on producing value without generating waste. TPS requires tight coordination between all workers, empowering them to build a car that

meets customers' needs within tight time frames.

TPS focuses on eliminating problems before they occur by encouraging workers to stop production if they find a defect. Under the conventional approach, individual production units lack sufficient incentives to report a defect since no one wants to be the bearer of bad news. Ironically, although TPS encourages employees to deliver bad news to their managers, this approach actually increases morale because employees are given more control over production. As a consequence, they are able to produce better quality products.

## How this applies to design and construction

The emphasis on teamwork and cooperation is evident in some emerging trends

in the construction industry. One recent trend is the design-build model of construction management, where builder and designer work together to meet client goals. LEAN Project Delivery takes this cooperation to the next level by forming a team in which the architect, builder and all other critical players in the project are treated as equals on a single team. The innovation of this approach over traditional methods is often compared to the story of the tortoise and the hare. More thorough, better planning and advance coordination will win the race.

A popular first step towards LEAN Project Delivery in the construction context is the use of a technique known as the Last Planner System<sup>®</sup> (LPS). Developed by the Lean Construction Institute (LCI), LPS focuses on establishing in-advance-relationships of trust and commitment between all players having a role in the project—from the first to the last. LPS takes the various players with their roles and helps them focus on their reliability in meeting the commitments they make on the project. When more companies reliably meet their commitments, the overall project will proceed more smoothly. This avoids the inefficiencies that result when individual team members look only to their own business entity's productivity and profit at the expense of the total project.

LPS begins with the formation of the core group. The core group normally comprises the owner, builder and architect. The core group then selects and invites additional members to join the team, such as engineers, subcontractors and material suppliers. These members have expertise that could help improve the project's ability to meet the owner's needs. And so, from the very beginning, tight production coordination occurs



between designers and builders—often a weak link under the traditional approach. LPS requires extensive advanced planning, including (1) the identification of major project milestones, (2) reverse phase scheduling between those milestones to identify handoffs of work between companies, and (3) look-ahead planning to determine what must be accomplished to achieve those handoffs (LCI 2006).

LPS then holds weekly or daily meetings to obtain promises from the “last planners” that they can perform fully and timely. If they are unable to complete their work as promised, the team will work together to identify and remove the constraints to completing work as planned. Furthermore, if team members are not confident they can perform on time, they are expected to be open and frank about their concerns so the team can address these problems collaboratively in advance.

A key driver of the LEAN approach is that rewards and compensation are tied to the value of the completed project as a whole. Individual players are expected to pitch in and help to correct problems other players are having, even if it means cross-disciplinary work. The team decides how to correct problems based upon maximizing value to the owner, and upon minimizing detrimental impact on other portions of the project.

Essentially, LPS replaces *optimistic* planning with *realistic* planning by evaluating whether workers can actually deliver on promised results and deadlines. When done effectively, projects will experience reduced costs, more timely delivery, increased quality and increased safety.

While LEAN Project Delivery is a relatively new concept, it is becoming prevalent in the U.S., United Kingdom, Denmark, Finland, Australia, Brazil, Chile and Peru (Ballard and Howell 2003). In Peru, for example, one contractor increased its profit by \$3 million on its first nine projects employing this approach (ibid).

### Implementing lean project delivery through relational contracts

California attorney William Lichtig in his article, “Integrated Agreement for LEAN Project Delivery” (*The Construction Lawyer*, summer 2006) proposes “relational contracts” as a way to implement LEAN Project Delivery. Relational contracts involve a philosophical change from traditional construction contracts. The traditional approach involves binding specific individuals to rigid unchanging tasks. This approach separates owner, designer, builder, subcontractor and supplier into discrete worlds that interact only through a series of transactions including contractual payments, deliveries and allocation of risks. By contrast, relational contracts create a system of cooperation, shared responsibility, shared rewards and shared risk, all tied to the amount of value generated in the end product. Initially the contract establishes the relationships within the core group, and subsequently adds members to the team through “joining agreements”.

Primary elements within a relational agreement should include:

- A statement outlining the project planning system, whether it be the LPS or an equivalent.

- The assignment of a cross-disciplinary group of senior executive representatives to oversee the group and foster a collaborative environment.
- A statement that clearly expresses the goals of the integrated team and the importance of each party’s contribution to the overall result.
- The call for a “target value design” plan stating how project participants work collectively to design to a target value as defined by the owner (Ballard and Reiser 2004). Thus, the agreement should also implement systems to determine whether targeted value objectives are actually met.
- A call for the development of a quality plan that communicates expectations to front-line workers. The plan should empower workers to “stop the production line” if they determine their work does not meet overall project objectives.
- An agreed formula for the distribution of gross profits to the team members at the end of the project. This may include an incentive sharing plan (funded with project savings) to encourage superior performance based on lean project delivery goals.

Construction professionals have much to learn from Toyota’s LEAN production methods. By fostering collaboration between team members, LEAN Project Delivery promises to make construction contracting more of a win-win proposition for everyone involved. ●

*Joseph A. Cleves, Jr. handles commercial transactions in construction and real estate. He has extensive experience working with contract documents and procedures.*

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## THE COMPANY: American Electric Power (AEP)

## THE HISTORY:

AEP is a true powerhouse, pun intended. As one of the largest electric utilities in the United States, its facilities deliver electricity to more than 5 million customers across 11 states. Just a few months ago, in December 2006, the company wrapped up a year-long celebration marking 100 years of success. It was 1906 when a certificate of incorporation was filed in Albany, New York for the American Gas and Electric Company. The company acquired its first utility properties in January 1907, which provided electric service, gas, water, steam, transit, and/or ice service in communities in New Jersey, New York, Pennsylvania, West Virginia, Ohio, Indiana and Illinois. The company became American Electric Power in 1958, and merged with Central and Southwest Corporation in 2000.

## THE RIGHT-NOW:

Ambitious is what best describes AEP's current endeavors. However, there is little doubt that management will meet and surpass the objectives set before them. As Michael W. Rencheck, Senior Vice President, Engineering, Projects & Field Services describes, 2007 will be a year marked by an ambitious construction program to build new facilities, as well as finishing a \$4 billion environmental retrofit program that began in 2004 at the companies existing coal-fueled plants.

"AEP has more than 2,000 megawatts of new gas and coal fueled generation scheduled to come online within the next 5 years and an additional 1,200 megawatts of Integrated Gasification Combined Cycle clean-coal plants that should be online in the mid-decade timeframe," explains Rencheck. "At the same time, we will be working to complete the environmental retrofit program

on our existing coal-fueled plants by 2010."

## THE FUTURE:

AEP is moving into the future with CO2 capture retrofit technology validation and commercial-scale retrofit projects on existing AEP plants. As Rencheck explains, "We will put a CO2 capture retrofit validation in place on our Mountaineer Plant in West Virginia in 2008 and scale up the technology to capture CO2 from one unit of our Northeastern Plant in Oklahoma by late 2011." This process dramatically reduces the energy required to capture carbon dioxide and isolates it in a highly concentrated, high-pressure form.

This forward-thinking may present the company with new challenges, notes Rencheck. However, he's confident, "The project teams will pull together and develop truly creative solutions. We are building equipment but the successful completion of these projects is really all about the people. Because it is about the people, our ultimate goal is to complete all of our construction projects safely, with everyone involved going home, safe and injury free everyday."

## THE SOCIAL COMMITMENT:

As AEP President George Tidd noted in 1934, "We prosper only as the community prospers; so we help it thrive in

every way we can." The company has carried on with that tradition of good will, using its skills and resources to better the community. One example of this is AEP's policy regarding climate change and the steps they've taken to reduce the growth of future greenhouse gas (GHG) emissions as the company builds new power plants to meet growing customer demand. Through its participation in the Chicago Climate Exchange since 2003, AEP will have reduced GHG emissions by 46 million metric tons by 2010.

## THE AWARDS:

### Most recently:

- LifeCare Alliance Meals on Wheels program—Corporate Route Spirit Award, 2007.
- Dave Thomas Foundation for Adoption: Best Adoption—Friendly Workplace in the energy and utilities sector, 2007.
- U.S. EPA recognition for SF6 (sulfur hexafluoride) emissions reductions from 1999 to 2005.

## THE FACTS:

- In 2006 AEP boasted a revenue of \$12.6 billion.
- AEP employs 20,400 people in the U.S.
- States served: Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia and West Virginia. ●

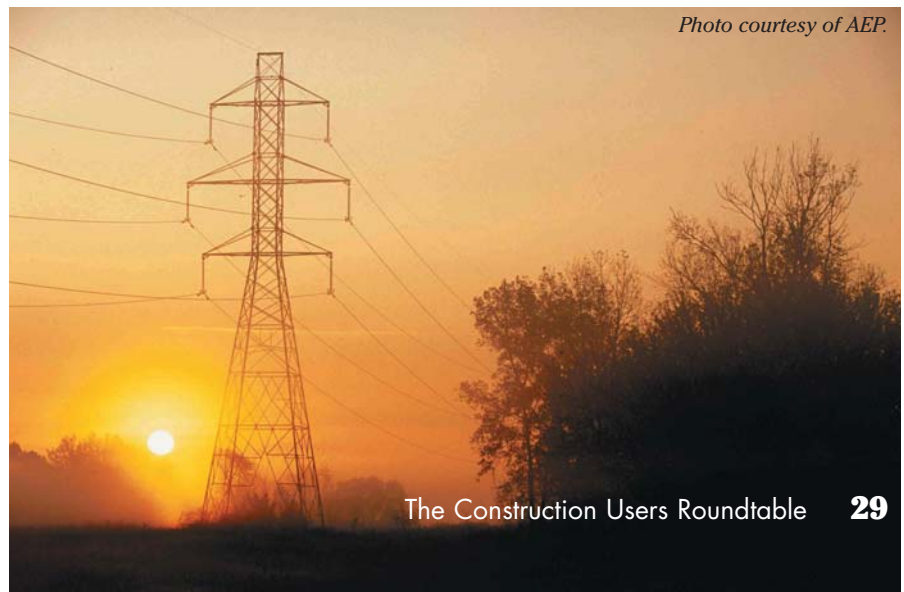


Photo courtesy of AEP.

## Challenge: Change Urban Skylines Around the Globe



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(54 Stories)*

*Palm Towers  
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*Sky Tower  
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(85 Stories)*

*The Buildings by Damam  
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# Membership Information

## Membership Categories

### REGULAR MEMBERSHIP

Construction Owner: Any industrial or major commercial user of construction or maintenance services who spends at least \$75 million annually as a corporation. The company must be represented by at least one high ranking corporate policy maker usually the vice-president or corporate manager of construction or engineering.

### ASSOCIATE MEMBERSHIP

Contractor, Subcontractor, Specialty Contractor, Supplier, Service Provider: From time to time the board may create a number of Associate Members positions. Provided space is available, Associate Members may be recommended by an Owner/Member and the recommendation must be accompanied by two letters of recommendation and be approved by a 2/3 majority vote of the Board.

### ASSOCIATION ASSOCIATE MEMBERSHIP

Any not-for-profit national trade association, research organization, or educational organization that provides services to the industrial or commercial construction industry may be eligible for membership in CURT and submit an application to join, provided they meet the Association Associate Membership requirements established by the Board of Trustees and an opening in this category of membership becomes available.

## CURT Members 2007

*Representatives from these companies are primarily Corporate Directors of Construction, Engineering or commensurate positions with decision-making authority.*

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NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)  
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take and developed a multi-pronged approach."

Key **musts** for owners included:

1. Recognizing the necessity of investing in training.
2. Establishing the expectations in the areas of workforce training and development, workforce recruitment, and worker retention.
3. Only doing business with contractors who invest in training and maintain the skills of their workforce.
4. Making contractor commitment to craft training a factor in the prequalification process, requiring in contract documents:
  - a. A description of the contractors overall company training program.
  - b. Details on investments made in training.
  - c. Information on any specific training planned for the proposed project.
  - d. Specific methods to evaluate skill proficiencies, such as skills assessment testing.
  - e. Evidence of support for the continued updating and improvement of apprenticeship training and journeyman upgrade training in the union sector.

When Katrina struck one year later, the fact that many owners didn't take action when the paper was first published exasperated the problem.

"Katrina brought everything to a head," said Richard Gill, Executive Vice President, Chairman of the Executive Committee and Interim President of the Power Group, The Shaw Group, Inc. "I've seen a lot in the past 40 years but I've never seen it like this before. This is a world-wide problem. There are different aspects of it—different degrees of shortages—but almost everyone is experiencing it to some extent."

The U.S. Department of Labor, according to the McGraw-Hill Report, *Key Trends in Construction, 2006*, estimates that one million new jobs will be added to the construction industry by

## Tangible Results

Forget the sun and the sand. High school students at Ft. Walton Beach Florida's **Community High: Okaloosa Institutes for Career Education** are spending their time making the CHOICE to build a solid future, preparing themselves to transition into a career in the trades.

CHOICE gives junior and senior high school students an alternative to regular classroom study. Participants spend three periods a day for 180 days each year soaking up all they can learn in a selected discipline. There are three different fields: AutoDesk design for students interested in architecture or engineering; construction management for those aiming to become project managers, construction superintendents and field engineers; and construction trades for potential master carpenters, electricians, plumbers or welders.

As the Institutes Dean, Matt Clark explains, "It's not a quick-fix. CHOICE is a solution." He continues, "Students are trained to use the latest software and technology for design and estimating. Most of what we do is hands-on and the results have been incredible."

So far, approximately 600 students have participated in the construction institute, with about 60 percent of graduates continuing their studies at a technical school, community college or university. While not all decide to stay in the industry, Clark eagerly points out that those who do clearly become passionate about the field. "They are focused and goal oriented. They want to have a career in construction and when they leave here, we've opened the doors that make that possible."

It is young workers, like the graduates from CHOICE, who are the future of the industry. And it is programs like it—one of many innovative training solutions discussed at the forum—that provide tangible solutions to a very real problem.

*CHOICE is just one of the many successful programs highlighted during the forum. Stay tuned to future issues of The Voice for stories on the others.*

2012. But the question begs, who will fill those positions?

Mark Fields, Global Category Manager-Americas, Shell Oil Company doesn't know. He's spent over two decades in the industry, talking to and working with contractors. Recently, he says, "I get the feeling that they're all fishing out of the same empty pond. There's just isn't the same workforce available out there, that we were once used to." In response to the current shortage, Fields says that Shell Oil Company approached their contractors and asked specifically what they could do to help. After all, he points out, "It's not a contractor-only thing. We're all affected."

"I've seen this before," reiterates Gill. "I've seen this before and I've seen the industry work through it." But, he cautions, "It's going to be painful."

## Owners with answers

So, what do owner's really think? Gerald Sprentall, CSC Construction Manager, Intel Corporation, Inc., and the CURT Workforce Committee Co-Chair tried to find out while moderating the panel, *What Owners Really Think*. A summary is below:

**Q Why is it important for DuPont to develop strategies to mitigate the workforce shortage?**

**A** *Ed Allison, Site Engineering Manager, DuPont Company*

As a science company, our mission is to put the science to work. In order to do that, we have to build safe, high quality and cost effective facilities. To accomplish this, we require a skilled workforce that can deliver the quali-

# CURT Comments

**Each issue The Voice will ask CURT leaders their thoughts on the major issues affecting the construction industry. Here CURT Officers, At Large Board of Trustee Members and Committee Chairs voice their opinions on LEAN Project Delivery and the workforce crisis.**

## CURT Officers

### Ricardo Aparicio, AIA, Esq.

President  
GENERAL ELECTRIC COMPANY  
Contracts Manager Project Services  
Birmingham, AL



"Today our industry continues to experience rapid changes. Whether in the design professions, the construction arena, insurance, or law, the multitude of disciplines that converge to make up the complex world of real estate development and capital improvements are experiencing daily new challenges. As owners, we can sit back and let it happen to us, struggling to keep up with the changes, or we can take a leading role in shaping the future."

Aparicio is in-house Counsel and Contracts Manager for General Electric's Corporate Properties and Services Operation. Aparicio holds a Bachelor of Architecture and Juris Doctor degrees from the University of Miami, Florida and is a certified specialist in Construction Law in the State of Florida, where he holds concurrent professional licenses to practice architecture, interior design, construction and law.

### Egon J. Larsen

Vice President  
AIR PRODUCTS AND CHEMICALS, INC.  
Global Construction Manager  
Allentown, PA



"The construction industry as a whole has been slow to accept change, including the acceptance of LEAN Project Delivery. Productivity has been flat for years but LEAN is a good tool for owners to influence real change. It will go a long way towards improving productivity across the industry and will also decrease capital costs. Owners should see value in this and should lean (no pun intended) towards partnering with contractors who implement these practices."

Larsen is responsible for Air Products and Chemicals, Inc.'s construction activities totaling approximately \$700M annually. This includes locations in the America's, Europe, Asia and the Middle East. With over 25 years of experience in managing projects and construction, he has been instrumental in numerous capital project initiatives and development programs.

### Larry Wargo

Secretary/Treasurer  
FIRSTENERGY  
Consultant, Contractor Services  
Akron, OH



"It seems to me that in many cases there is still an attitude of, 'It's happening to others but it won't happen to us'. But this situation demonstrates a textbook case of supply and demand. As owners we control the entire demand side but as of yet, accurate, specific information is far too slow in developing. The first step is for owners to understand what their needs are much further in advance and then communicate those needs to those who supply the resources. If, as owners, you have a problem letting the appropriate people know what your needs are, then do not expect to staff your projects."

Larry Wargo has been with Ohio Edison and FirstEnergy Corp. for over 30 years. Over the years, he has held a number of management positions in fossil generation and, most recently, is a consultant for contractor services. In addition to his duties with FirstEnergy Corp., Wargo serves in a variety of capacities with a number of different associations. These include CURT's Industrial Relations Committee, National Tripartite Committee, Overtime Sub-Committee; the Northwest Ohio Great Lakes Construction Alliance; the Boilermaker National Conference Planning Committee; the Ohio Construction Coalition Absenteeism Committee; and judge for the NMAPC Zero Injury Safety Awards Program.

## At Large Board of Trustee Members



### Tom Weise

Past President  
INTEL CORP.  
Director of Facilities,  
Materials & Services  
Chandler, AZ

"The near-term workforce issues are not as serious as one might think. For example, within Intel we still find the people we need to complete our construction processes. We do, of course, have methods to accomplish this but the net result is we get the job done. It's the long-term that is the concern. There is a storm brewing that WILL put us at risk with regards to labor shortages. If the owners don't prepare for the pending storm we will be forced to respond in a reactionary mode that will cost us our competitiveness will cause us to compete for labor, and will increase our risk on safety performance. This isn't a healthy state of business."

Tom Weise is currently responsible for the acquisition and supplier management of Intel's global construction business. He has received numerous Intel Recognitions such as; "Contribution to Materials Training and Career Development," "Development of Intel's Supplier Continuous Quality Improvement Process," and "Development of the Intel Advanced Total Cost Method."



### William P. Tibbitt

JOHNSON & JOHNSON  
Executive Director,  
Worldwide Engineering Services  
New Brunswick, NJ

"LEAN holds the promise of improving project delivery processes, reducing the completion times and of course the costs involved. That is why at Johnson & Johnson we are investigating and evaluating LEAN practices. What intrigues us is how well LEAN can be integrated with BIM [Building Information Management]. We've used 3-D design for quite some time but we want to take it to the next level. To that end, we've identified some LEAN practices that could help us."

In his present position, Bill Tibbitt and the group he leads are responsible for the project management of all of Johnson & Johnson's major capital projects worldwide. Tibbitt has served CURT in several capacities including President and most recently, as Co-Chair of the 3XPT Strategy Group and Board Member.



### Steven B. Satrom

President Emeritus  
AIR PRODUCTS AND CHEMICALS, INC.  
Vice President of Engineering,  
Energy Businesses  
Allentown, PA

"About three years ago CURT published a white paper [WP-401 Confronting the Skilled Workforce Shortage] in which we took a look at what our members were telling us and we found that as a group, the majority was already seeing shortages of craft labor on some of their sites. In that paper we said the solution has to be a multi-prong approach which included rebuilding our image, recruitment, training, and also retaining the aging workforce that we already have. We also have to show the workers who are new to the industry why a career path in it is a good choice, to make sure they have good reasons to stick around. This isn't just about 'how do I build, how do I recruit, how do I train people'—it's about sustainability and how to fix the problem for the long run."

Satrom was the first President of CURT and one of the eight founding members. He was instrumental in establishing the initial focus for the organization, creating a viable entity and gaining the industry acceptance and recognition necessary for it to become the "Voice of the Owner".



### Allen Bunner

TYCO INTERNATIONAL  
Director Engineered Systems  
Bath, OH

On the *Crisis in Construction: HELP WANTED* Business Forum in New Orleans: "The Katrina and Rita devastation have served as a tipping point for workforce issues and New Orleans is now considered as a rallying point for the subject. The Gulf region will require a substantial amount of crafts people to rebuild, yet the reality is workforce issues are global and extend well beyond the region, and require an expedited response. I believe this reality is now being accepted by all impacted factions. I applaud the McGraw Hill/ENR efforts to move this subject into the forefront of our daily construction discourse. The CURT organization appreciated the opportunity to jointly brand the forum in New Orleans with ENR, as well as provide substantial input into the event's subject matter."

Bunner has had more than 30 years of mechanical and electrical contracting background, specializing in fixed fire protection systems, including more than 20 years focused in Special Hazards systems, and 15 years experience with International contracting and exportation of fire protection technologies.



**Curtis Ashley Baker, P.E.**  
SOUTHERN COMPANY GENERATION  
Vice President, Construction  
Birmingham, AL

"Finding solutions to the workforce crisis is absolutely essential for our success. We are embarking on a large construction program across our service territory—both with retrofits and new construction. With all this, we are facing the largest manpower need we have ever seen. That's why we are working on both short and long term strategies. This includes working closely with the unions, with open-shop contractors and with other owners to find real strategies and solutions."

Baker is currently responsible for the implementation of Southern Company Generation's environmental projects in Alabama, Florida and Mississippi, with project estimates totaling approximately \$3 billion. He has twenty-eight years experience in Project Management and Construction in the Utility industry. Baker participates on the CURT Tripartite Initiative and the CURT Katrina Response Committee.



**Michael G. Conley**  
DUPONT  
Engineering Manager  
Wilmington, DE

"Owners need to play a key role in resolving the workforce issue. They must take a leadership role and can do this in many ways: by participating in and with industry organizations like CURT and Local Users Councils (LUCs); by demanding their contractors have robust training programs; and by participating in processes to help better define upcoming demand. There are positive signs that owners are serious about improving the situation but we have a long way to go. As an industry, we have made dramatic improvements in safety performance. We can do the same for workforce development."

Michael G. Conley has over 25 years of construction and engineering management experience. His career has spanned the United States and Europe, and includes construction, design, project controls, project management and business engineering management. He currently manages the DuPont Project Engineering Center, a unique organization whose goal is project execution excellence and the renewal of engineering skills within DuPont.

In 2002, he became DuPont representative to the Construction Users Roundtable (CURT). He has served as co-chair of the CURT open shop subcommittee of the workforce development committee. Conley has also served on the board of trustees for the National Center for Construction Education and Research (NCCER).



**Gregory L. Sizemore, Esq.**  
Executive Vice President  
THE CONSTRUCTION  
USERS ROUNDTABLE  
Cincinnati, OH

"While the workforce crisis is a major challenge to the industry, owners cannot wait for the others in the industry to respond. The industry will do its best to meet the needs of the owner community, but owners are also compelled to look for mitigation strategies as well as longer term solutions. LEAN is one approach that will improve productivity and drive down costs. CURT and the owner community will certainly pursue others as well."

Sizemore has over 25 years of construction industry and association management experience. For eighteen years Sizemore has been the Executive Director of the Construction Owners Association of the Tri-State (COATS) in Cincinnati, Ohio, and, in 1989 Sizemore started Sizemore & Company, a construction industry association management and consulting firm. He was instrumental in the start-up of CURT and has served as the Executive Director since its inception. Sizemore serves on various industry and civic boards including the University of Cincinnati's Industrial Advisory Council, the Advisory Committee to the Albany Technical College, the West Virginia Construction Coalition Conference and the ACE Mentor Board.

## CURT Committees

### Education and Implementation Committee



**Patrick Duffy**  
Chairman  
TAMPA ELECTRIC COMPANY  
Manager, Project Management  
Tampa, FL

"The workforce shortage is real and it's happening now. Labor rates are up and craftsmanship is disappointing. If it continues to get worse the impacts will be quite serious in terms of cost, schedule, quality and perhaps safety. However, I am a believer in the corrective nature of the free market, and I'm always skeptical of long-term forecasts. The strategy to fix the problem is fairly well recognized; training, better recruiting, improved retention, and an improved industry image. The big questions now are how to do it and who should do it."

Patrick Duffy has been managing projects at Tampa Electric for seven years and is currently responsible for transmission and distribution projects. Before that, he spent 10 years with a large engineering and construction firm working primarily for the process industries. Duffy has been active with CURT since 2002 and is the Past President of the Florida Construction Users Roundtable (FCURT).

## CURT Committees continued



### LEAN Construction Committee



#### Joe P. Gionfriddo

Co-Chairman  
PROCTER & GAMBLE COMPANY  
Corporate Engineering-Global  
Construction Management Process Owner  
West Chester, OH

"If LEAN Project Delivery is implemented in its fullest, it will provide a win-win for both the owner and contractors. It eliminates waste, drives the competitive edge for the stakeholders, improves productivity and efficiency, and demonstrates creativity and innovation, making the industry more attractive for our future workforce. It is the breakthrough improvement that our industry needs to compete and grow for the future on a global scale."

For the past 25 years, Gionfriddo has worked across six of the seven global business units within Procter & Gamble, holding various manufacturing and capital management roles. He is viewed as a capital management master in project/construction management, receiving one of their highest technical recognitions, the Procter & Gamble Capital Management Leadership & Mastery Award in 2002.



### LEAN Construction Committee

#### Albert Schwarzkopf



Co-Chairman  
MERCK AND CO., INC  
Project Engineer Global  
Engineering Services Durham, NC

"Lead by example. Change comes from the top. It does not matter what

cliché you use, real and sustained change will only come from those that have a vested interest in it. The owner always has a vested interest in successful completion of projects. As such, the owner is in the best position to drive change in projects and thus the industry, when it comes to LEAN Project Delivery. The construction industry has not had a substantial productivity improvement in 40 years, while manufacturing has more than doubled its productivity. Combine this with the labor shortage and it becomes apparent that the industry will soon demand that we find a new way to conduct business."

Al Schwarzkopf has been with Merck & Co for 12 years and currently manages projects within the SE Region and Latin America for Merck. In his position he is responsible for all capital projects under \$5 million at the new Vaccine Manufacturing Facility in Durham NC and some additional projects throughout the Southeast region and Puerto Rico.

### Process Transformation Committee



#### Charles G. Hardy

Co-Chairman  
GENERAL SERVICES ADMINISTRATION, CCM  
Director of Construction  
Chicago, IL

"The workforce crisis is extremely serious.

"While I speak as an owner, I believe all sectors of the industry agree. We are seeing it in project pricing, in the outsourcing/off-shoring of design activities and the availability of a skilled workforce to meet the business goals for the asset the owner is putting in place. I also believe that the owner shares in responsibility and care for the stewardship of the construction industry. Strong owner leadership is essential in focusing the industry on the workforce issue just as it has done in focusing the industry on process transformation through the formation of the 3XPT Strategy Group."

Charles G. Hardy is a registered architect, a certified construction manager and a nominee for the Miles Romney Innovation in Real Property Management. Before joining GSA in 1991, Hardy was an architect with architectural firms in Florida and Illinois practicing in the areas of real estate development and office design. Additionally, Hardy is an officer in the U.S. Air Force Reserve.



### Process Transformation Committee

#### Stephen D. Lane



Co-Chairman  
CITIGROUP, INC.  
Vice President  
Chicago, IL

"Demographics and independent studies

point to the fact that the number of skilled tradesman is diminishing while the demand for skilled labor is increasing. The lack of balance between supply and demand will ultimately cause some projects to be delayed and prices to escalate. The owners have to recognize and plan so that resources are used efficiently. They also need to work with the trades and design firms to encourage more candidates to consider construction, architecture and engineering as good career choices."

Stephen Lane is currently the Global Director of Capital Projects for CITI Realty Services, which involves the review and approval of the capital requirements for projects that have budgets of \$10 million and greater. He is an active participant in the Business Roundtable's (BRT) "Climate Resolve" program, the World Resource Institute's "Climate Northeast" work group, and is also a member of Business Roundtable's steering committee on the "S.E.E Change" initiative. Lane has held several operations and management positions during his 30-year career, many that focused on construction, building operations and/or energy efficiency.

## Safety Committee



### Bob Krzywicki

Co-Chairman  
E. I. DUPONT  
Contractor Safety Practice  
Manager  
Wilmington, DE

"The leadership shown by the owner is paramount when introducing new concepts to projects. This is certainly the case when it comes to implement LEAN Project Delivery. Without owner leadership and support the success probability of any change is severely reduced. That is why the owner community must broadly support and implement LEAN practices for the industry to benefit. If there is broad support from the owner community then the rest of the value chain will buy-in and only then will the benefits be seen across the entire industry."

Bob Krzywicki has 25 years of experience at the DuPont Company specializing in construction and contractor safety issues. As the Manager for this practice for DuPont Safety Resources, Krzywicki leads a specialized consulting practice team and is responsible for marketing, sales, product development and delivery of services to clients worldwide.



## Workforce Development and Industrial Relations Committee



### Steve Mongiardo

Chairman  
MERCK & CO., INC.  
Senior Director, Infrastructure,  
Environmental and Office Projects  
Lebanon, NJ

"Because owners ultimately pay for the lack of labor, they have to take a leadership role in pulling contractors and labor together. If they don't, they'll experience increased costs due to competition for labor, and delays in completion of revenue generating projects. There is no real incentive for contractors and labor to address the problem. That is why owners must impress upon the industry the impact the lack of an adequately trained workforce has on the economy of the nation. If the problem can't be fixed, owners who have the ability will take projects overseas. Others will delay and defer capital investments."

Steve Mongiardo has been with Merck & Co., Inc. for 21 years and currently manages projects at domestic Merck sites including West Point, PA, Danville, PA and Albany, GA, Elkton, VA. In his position he is responsible for all major capital utilities/infrastructure projects which support new research and manufacturing facilities. These projects include new power generation facilities, high voltage distribution systems, water treatment facilities, office complexes, site development, parking garages, and chilled water distribution facilities. Mongiardo was elected in June 2007 to the CURT Board.

## Technology Deployment Committee



### Michael S. Alianza

Co-Chairman  
INTEL CORP.  
Senior Analyst  
Chandler, AZ

CURT would like to extend many thanks to Mike Alianza for his dedication to the Technology Deployment Committee, which is currently merging with the Process Transformation Committee. For more information go to [www.curt.org](http://www.curt.org).

"As the senior analyst to Intel Corporation's Corporate Services division, Alianza provides forward looking advice and implementation plans for new industry trends and technology within construction. With a career started by digging foundations by hand twenty-five years ago in the Philippines, Alianza has come to focus on practical user friendly construction solutions. These solutions range from practical new ceiling structure designs, revolutionary new facility designs, and operation software tools, which are the latest technologies in construction management.



## National Conference Planning Committee



### Doug S. Graham

Chairman  
BOEING COMPANY  
Senior Manager Contract  
Design & Construction  
St. Louis, MO

"LEAN has been a part of our strategy for many years and has delivered proven results, improving the bottom line of the corporation. Having seen the benefits firsthand, owners must mandate that these tools and techniques be applied to the construction industry in order to realize improvements in cost, quality, schedule, productivity and risk reduction, to name a few. By removing waste from the process, the efficiencies gained will result in the ability to manage work more efficiently. This in turn will help address professional and craft workforce availability."

Doug Graham is a Senior Manager with the Boeing Company and has been employed with them for over 20 years. He currently manages a union and salaried staff, is responsible for approximately 30 buildings that cover 2.5 million square feet, and also oversees plant engineering, contracted design and construction, fire protection engineering, and utilities management activities for all Boeing's St. Louis facilities. Graham holds a Bachelors Degree in Civil Engineering from Washington University in St. Louis and an MBA from Fontbonne University. ●

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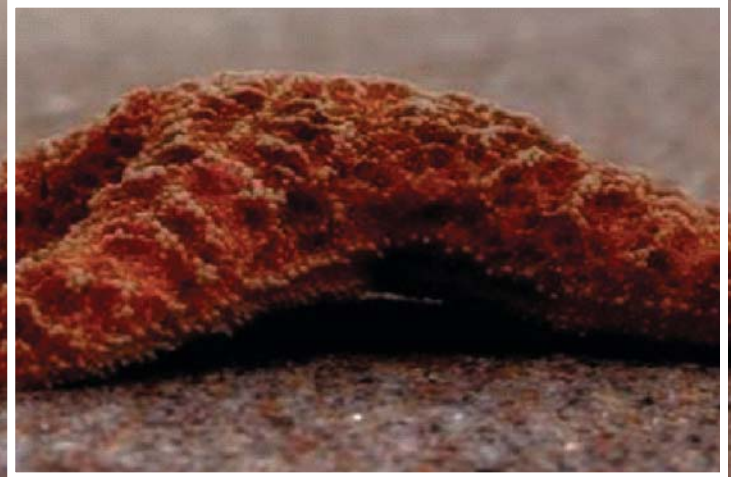
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# The 2007 CURT National Conference

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Photos courtesy of Naples, Marco Island Everglades CVB.



# ConsensusDOCS Transforms Traditional Contracts

Historic document benefits owners, contractors, design professionals and surety associations

**A** venture by the construction industry's leading associations, including CURT, to provide a standard set of contract documents is gearing up for release this fall. The documents, now officially named ConsensusDOCS, will allow parties to focus on project results rather than spending valuable time negotiating contract terms, or worse, contract claims to assess fault.

The contract documents have been in development for three years and were first announced in June 2006. At that time, Greg Sizemore pointed out, "It is in the enlightened self-interest of all parties—owners, design professionals, and general and subcontractors—to draft fair contracts." Now, after much collaboration and hard work, that objective has almost been met.

ConsensusDOCS has received backing from many of the major construction-related associations in the United States. Most are hoping that once in use, they will save transactional time and money by eliminating the need to repetitively negotiate one-sided terms.

As Teresa Magnus, Construction Contract Strategy Manager at Southern Company (one of the country's largest generators of

producing balanced contracts that are actively supported by all parties. The level of diverse buy-in for these contracts is unprecedented and reflects a genuine effort to work collaboratively to determine industry best practices for standard form contracts." ●



## Did you Know?

The term ConsensusDOCS refers to consensus among Designers, Owners, Contractors, Subcontractors/Sureties, all which represent the wide range of associations participating in this collaborative consensus effort.

electricity) points out, keeping up with the many documents that have surfaced in recent years can be difficult. She points to the Houston market, for example, where, "Parties report 54 different versions of 'standard' documents in use. This makes the construction process less efficient and fractured. That is why all of the major industry associations were invited to the drafting table. The documents always keep in mind the projects' best interests—rather than protect a singular overriding interest of one party participant."

The contract documents will comprise of construction contracts and forms pertaining to design-bid-build, design-build, and construction management at-risk. In addition, a new document will address the use of information in electronic format, and thereby facilitate the use of Building Information Modeling (BIM).

In action, ConsensusDOCS will appease the growing frustration of many parties—owners in particular—who are presented with heavily modified standard form documents that hardly resemble the original text. Magnus notes that the construction industry is fractured and can, at times, be reactive rather than proactive. She believes that ConsensusDOCS will change that. "We will be

## Who's Involved

The following groups have participated in developing ConsensusDOCS:

- American Subcontractors Association, Inc.
- Associated Building Contractors
- Associated General Contractors of America
- Associated Specialty Contractors, Inc.
- Building Owners and Managers Association
- Construction Industry Round Table
- Construction Owners Association of America
- Construction Users Roundtable
- Engineers Joint Contract Documents Committee
- Mason Contractors Association of America
- Mechanical Contractors Association of America
- National Association of State Facilities Administrators
- National Association of Surety Bond Producers
- National Electrical Contractors Association
- National Insulation & Abatement Contractors Association
- National Roofing Contractors Association
- Painting and Decorating Contractors of America
- Plumbing-Heating-Cooling Contractors Association
- Sheet Metal and Air Conditioning Contractors' National Association
- Surety & Fidelity Association of America

# 3XPT Workshop Propels Partnership to the Next Level

## Industry leaders meet to hammer out possible BIM difficulties

### Did you Know?

The term 3XPT symbolizes the three groups involved (CURT, the Association of General Contractors and the American Institute of Architects) and the desire to achieve Project Transformation—using new technology tool sets (such as BIM) to reduce costs, shorten schedules and create higher quality projects. It was officially announced one year ago and has since created a buzz throughout the industry as leaders meet to propel the concept forward.

Owners, general contractors, specialty contractors, members of the A&E community, insurers and surety experts met in Chicago July 16-17, 2007, for a *by-invitation-only* 3XPT Workshop. Participants from each sector, approximately 50 in total, were invited based on their previous use of and experience with Building Information Models (BIM).

As Christopher Monek, the Senior Executive Director of Business Development, Programs and Industry Relations for the Associated General Contractors of America explains, participants broke into groups to discuss four major areas of concern, relating to BIM. They are:

- Design-build;
- Design-bid-build;
- Construction management at-risk; and
- A project that is integrated and fully modeled.

The agenda was facilitated by Martin Fischer, Director of the Center for Integrated Facility Engineering (CIFE) at Stanford University. CIFE brings together faculty members, researchers, students and

industry participants from diverse domains, such as civil engineering, architecture, computer science, business and law.

"Each of the four focus areas were addressed by team members who identified potential areas of concern," says Monek. "At the end of the process, we all got back together and talked about what was learned. No one knew what the outcomes were going to be so it was very interesting."

Monek notes that enough issues were

identified to create a report for the industry, which will then be presented at major events this fall.

"This workshop really took 3XPT [see sidebar for explanation] to the next level," says Monek. "It was another step toward propelling change and moving our industry forward." ●

*Editor's Note: This article was written before the actual workshop in order to meet a press deadline of July 1.*

### CURT-CIFE Survey Results Now in

Results from the 2007 CURT-CIFE Building Information Modeling/Virtual Design and Construction (BIM/VDC) Use Survey are now available. Conducted by John Kunz and Brian Gilligan from the Center for Integrated Facility Engineering (CIFE) at Stanford University, the survey endeavored to gauge the use of BIM/VDC, as well as the benefits and drawbacks experienced within the construction industry.

For specific results visit <http://cife.stanford.edu/> and download the VDC/BIM Use Survey.



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# Hurricane Affected LUCs Never Doubt Rebuilding



Steve Springer, Executive Director of the Greater New Orleans Business Roundtable (GNOBR), has experienced hurricanes firsthand many times before. However, until Hurricane Katrina hit in late August 2005, he had never thought that it was necessary to evacuate. Katrina was different. When the levees broke and the water rushed into the city—taking property and lives along the way—he was thankful he had evacuated the city with his family before the hurricane hit.

Nevertheless, when the sun shone again, rebuilding was on everyone's mind. "From the very beginning, communications with GNOBR members demonstrated a positive mindset in which reconstruction was first and foremost," recalls Springer. "There was never any talk of relocating or moving plants. The desire to move forward was amazing."

Many of the world's biggest petrochemical plants were located directly in the hurricane's path, including those owned and operated by GNOBR members, such as ExxonMobil Corporation, Air Products and Chemicals, Inc., Chevron Corporation and ConocoPhillips Company. Most were back up and running shortly after the disaster and those that did need more extensive repairs are now all fully operational.

## Outside offers

Within the GNOBR everything is also back to business as usual. Springer remembers working out of his home in the days after Katrina, noting that there were many offers of help (for example, the Greater Baton Rouge Industry Alliance and the Houston Gulf Coast Area Business Roundtable offered office space, and the Construction Users Roundtable funneled donations to GNOBR for much-needed items like new computer equipment).

"I was thankful for the help," says Springer. "When I got to my office the first floor was flooded. Luckily though, there was not much damage to the second floor, where all the office files were kept."

In Baton Rouge, also hit by Katrina—although to a lesser extent—Connie Fabre, Executive Director of the Greater Baton Rouge Industry Alliance (GBRIA) recalls trees falling on people's homes, supply issues and some damage to her member's petrochemical plants. Like Springer though, she remembers an immediate desire to clean up and get back to work. "Personally, I housed several evacuees from New Orleans, as did many other Baton Rouge citizens. More broadly, my members donated millions to the rebuilding efforts."

This includes:

- More than \$23 million from the Exxon-Mobil Foundation to aid in disaster relief, recovery and rebuilding;
- The establishment of the Humanitarian Emergency Assistance and Response Team (HEART) fund by Air Products and Chemicals, Inc., which provides counseling, housing and meals, medical help, and other financial assistance in the aftermath of Hurricane Katrina; and
- Over \$1 million donated by employees and retirees of the Dow Chemical Company, which was then matched by the Dow Chemical Company Foundation.

## Lessons learned

Both Springer and Fabre are quick to acknowledge that many lessons were learned in the hurricane's aftermath. In Springer's case, not being able to get to the office meant not having access to any previous emails and not having contact information for anyone he was dealing with prior to the hurricane. He notes that now he has an external hard drive to save everything to and he says, "If I have a bad feeling about the weather, I take it home with me!"

## Thoughts on the future

"Baton Rouge still has evacuees from New Orleans living in trailers," points out Fabre. "Those who still work in New Orleans get up at 4 am to catch a bus into the city. It's an hour and a half trip, one way, but for many it's the only option."

Tales like this point to the bigger problem—a shortage of manpower to rebuild. "We're looking at different options," says Springer. This includes developing a plan with GBRIA to bring non-English speaking workers to the area, and the GREAT initiative, developed by the Business Roundtable, which will train 20,000 new workers by the end of 2009.

"Before the hurricanes of 2005, the main focus in our area was achieving best practices. Now, no matter where you go, everyone is talking about manpower. There's hope but we need to turn up the heat and make something happen." ●

# Building Information Modeling

## It's Your Obligation as a Professional

By Dana K. Smith, AIA

**W**hen I was asked to write an article in favor of Building Information Modeling (BIM), I quickly agreed. It's a great opportunity to share my own feelings—that BIM is the answer to what is currently a plagued construction industry.

BIM is an idea that has come of age based on much of the other technology around us. Most are primarily office products such as word processing, spreadsheets and graphic products, coupled with the Internet. However, when it comes to BIM, our industry is lagging behind the automobile, aviation and ship-building industries—all of which have been modeling electronically for quite some time now. There has not been a significant penetration of BIM in our industry yet but there have been enough successes now to show that we are certainly on the right track. It is much different than CAD, as that was simply automating the drawing process. BIM is providing a whole new way of doing business.

We are working in a three trillion dollar industry where some have estimated that there is up to 30 percent waste. I think we have a responsibility to fix that.

Who wouldn't want to first build a facility virtually; working out problems prior to physically building it? Eliminating change orders and significantly reducing requests for information (RFI) which are time consuming, costly and create significant waste is a huge initial benefit. Reducing lifecycle costs throughout the life of the facility is a long-term benefit.

BIM provides an opportunity to analyze a model for:

- Constructability conflicts;
- Ways to reduce energy usage;
- Validating energy reducing design ideas;
- Improving life safety;

*continued on page 46*

## Better, Worse or Just Different?

By Ian Howell and Bob Batcheler, Newforma

**T**he good news: Building Information Modeling (BIM) has dramatically accelerated design iteration by way of tools that can instantly represent design changes and their impact. In addition, by sharing the model and a common underlying database of building objects, designers and builders can now collaborate sooner in the building project lifecycle—when the cost of change has a smaller impact on the project plan.

However, from our customers on the design side, we hear some concerns. True, BIM has brought project teams closer sooner and design iteration has jumped to warp speed, but what does that mean for other project processes that have been molded around years of 2-D drawings? Are shop drawings a soon-to-be dinosaur? How will the real-time, collaborative world of BIM affect the asynchronous, phase-delineated processes that for years have protected the tracking, review and quality of project deliverables?

True, BIM has brought project teams closer sooner and design iteration has jumped to warp speed, but what does that mean for other project processes that have been molded around years of 2-D drawings? Are shop drawings a soon-to-be dinosaur?

Why are designers concerned? One factor, ironically, is that in this early adoption period where not all project team members are using BIM or where their different models are not yet interoperable, BIM is creating *more* documents rather than less. Why? Because, with a BIM tool, a full set of updated model documents can be produced at the push of a button. What is the process to

*continued on page 46*

The opinions and ideas expressed in the BACK AT YOU SECTION are not necessarily those of CURT. If you would like to contribute to our BACK AT YOU SECTION please send topic ideas/completed articles to editor@matrixgroupinc.net for review.

*continued from page 45*

- Incorporating ADA (Americans with Disability Act) compliance checks;
- Checking building code compliance; and
- Building an investment reserve study to identify how much money will need to be spent to keep all the systems in the facility working properly.

Why recollect the same data over and over again throughout the life of the facility? Someone did have that data stored electronically but chose not to make it available for those coming later in the lifecycle. This wastes valuable time and as NIST (the National Institute of Standards and Technology) identified in 2004, costs the owner \$15.8 billion a year. We are working in a three trillion dollar industry where some have estimated that there is up to 30 percent waste. I think we have a responsibility to fix that.

Data collection and storage is currently not part of the initial business process so as an add-on task, it is a burden. In response, we are working as an industry to make it more effective by revising the business processes. The value recognized by many in design and construction to this point is only the tip of the iceberg as the process and tools will only continue to improve over time. Having open standards will make this go faster and create a better end result. Collecting detailed information is not the problem it once was and detailed information can always be summarized into higher level uses and then broken back down to the detailed information to validate a decision.

There are many fine examples of how BIM is working now. With large hospital projects adopting a **D**esign, **B**uild, **O**perate, **M**aintain (DBOM) approach is leading to more sustainable, energy efficient and environmentally friendly facilities. BIM is also being applied to existing facilities such as the Sydney Opera House, where those involved realized that it is more costly not to build with BIM since it is going to be occupied for the next 200 or more years.

Finally, who wouldn't want to support the buildingSMART® Alliance™, which is quite possibly the most important endeavor ever initiated for the real property industry? It is focused on reversing the declining productivity in the United States construction industry, as well as improving sustainability, and reducing energy usage and the negative environmental impact of facilities and infrastructure in our world. The buildingSMART® Alliance™, formerly the IAI International, has a 10 year head start into this endeavor, building open standards with resources in 26 countries that are already working to make interoperability happen.

Go to [www.buildingsmartalliance.org](http://www.buildingsmartalliance.org) and join the group making BIM a reality. ●

*Dana K. "Deke" Smith, AIA, is the Executive Director of the buildingSMART Alliance. This program of the National Institute for Building Sciences (NIBS) has been chartered by Congress to build a bridge between the public and private sectors in order to advance building construction in the United States.*

*continued from page 45*

manage the resulting proliferation of saved views, design iterations and document versions? Some of the traditional best practices for organized communication with the project team will need to stretch, at least temporarily, to support an even more prolific BIM environment.

Also, while the coordinating geometry of a BIM model makes it easier to identify clashes, what is the corresponding process to support resolution of these conflicts? Sure, simple dimensional conflicts can be quickly addressed, but what about those issues where choices need to be made about design alternatives—where senior expertise is required or a significant cost consequence needs to be addressed? To facilitate input from non-BIM-enabled members of the project team, 3-D view and markup capability will need to bridge the gap. Furthermore, clashes that do become issues will still need to be tracked to a timely resolution and the decision trail logged for future reference, no matter when or how collaboratively they are identified in the project lifecycle.

Finally, the power to manipulate parametric building objects in BIM can also be a potential hazard for the project team. A change to an object means that every other occurrence of that object throughout the entire model—not just those in current view—will also reconcile to that change. The result can be unexpected and unintended changes elsewhere in the model. In a more synchronous and collaborative environment, how can designers and builders manage this risk together? A shared, just-in-time Q&A process will be needed to automatically surface any unintended changes that could ripple through the model.

Our conclusion? Even though BIM has had a positive impact on design iteration and collaboration, it has challenged other facets of project execution. Best practices designed to reduce exposure to errors or omissions (documenting the project decision-making process, facilitating the sharing of project information and proactively managing issues to resolution) are not made obsolete by BIM, but they will need to evolve to accommodate it. Adoption of BIM will force the industry to invent new work processes so that the full, time-tested experience of the project team continues to be brought to bear on the management and ultimate quality of the project. ●

*Ian Howell, Chief Executive Officer of Newforma, is also an Australian architect, a co-founder and current board member of the International Alliance for Interoperability, and a building industry veteran with extensive experience in applied technology.*

*Bob Batcheler, Vice President of Product Management and Industry Marketing at Newforma, is a qualified civil engineer with broad project experience, and while at Sofodesk and Autodesk, served in many roles, including Director of Product Management for the AutoCAD 2004®, and Autodesk Architectural Desktop 2004 products.*

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# Can Immigration Solve the Workforce Crisis?

**A**midst the discussions at the Construction Business Forum *Crisis in Construction: HELP WANTED* (see page 20 for the story) there was an audible buzz in the room whenever the topic of immigration as a workforce solution came up. While a hot topic for the industry on any normal day, the issue of immigration was even more poignant in early June as the U.S. Senate was in a heated debate regarding a revised immigration bill.

The bill would impose a \$5,000 U.S. fine on illegal immigrants and then return them to their home countries (only the head of an undocumented family would be sent home). Once there, they could apply for permanent residency in the States. The bill also includes a proposal to

introduce a points system that would prioritize access to the U.S. for skilled and educated immigrants, as well as new family-reunification guidelines.

The points system is something that the United States' neighbor to the north, Canada, is very familiar with. Under the Canadian points-based merit system, prospective immigrants are graded on six criteria, including education, their skills in the two official languages, work experience, age, arranged employment and adaptability.

The United States currently uses a family-based preference system, which has been in place since the mid 1960s. The points-based system has been the source of much debate, though, with President George W. Bush and some senators supporting a point-based system as a way to

select immigrants who are most likely to make long-term contributions to the US, saying it would use objective criteria to measure job skills, education and other attributes. On the other hand, some leading Democrats oppose the plan, saying it is social engineering and reflects class bias.

In March 2006, the Pew Hispanic Center calculated the number of undocumented immigrants in the U.S. at somewhere between 11.5 million to 12 million. Two months later, in May, U.S. president George W. Bush addressed the nation to discuss his immigration proposals. Bush outlined five clear objectives: securing the borders, creating a temporary worker program, holding employers to account for the workers they hire, allowing illegal immigrants "who

## The Great Debate

**Here is what two politicians are saying:**

"After listening to hour after hour of floor debate, I do not believe there is a single Senator who does not see the urgent need to fix our badly broken immigration system. Every one of us agrees that we need a bill. Yet when it came time vote on the bipartisan compromise last Thursday night, only seven Republicans joined with 38 Democrats to invoke cloture. I want to get this bill done. The overwhelming majority of the Democratic caucus has already voted for cloture. The American people are certainly looking to Congress for leadership. We hope that President Bush and his Republican allies in Congress will find their way to work with us to deliver this bill to the immigrants, businesses, and all Americans who demand and deserve it."

***Senate Majority Leader Harry Reid of Nevada (Democrat) made these remarks on the floor of the U.S. Senate, directed towards President George W. Bush. June 11, 2007.***

"I strongly oppose today's bill going through the Senate. It is the wrong approach. Any legislation that allows illegal immigrants to stay in the country indefinitely, as the new 'Z-Visa' does, is a form of amnesty. That is unfair to the millions of people who have applied to legally immigrate to the U.S. Today's Senate agreement falls short of the actions needed to both solve our country's illegal immigration problem and also strengthen our legal immigration system. Border security and a reliable employment verification system must be our first priority."

***Boston, Mass. Governor Mitt Romney. May 17, 2007. Romney has started his campaign for the Republican presidential nomination in 2008, having formally announced his candidacy in February, 2007.***



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have roots" in the country to apply for citizenship, and helping newcomers assimilate into American society.

Since then, Bush's proposal has been on the minds of many, including panelists and attendants at the ENR/CURT Workforce Summit, held in New Orleans, LA. When an audience member asked for thoughts on the proposed bill, one panelist responded, "We have the attitude that immigrant workers are not trained well in the trades and we have to change that, although I have skepticism that this attitude will be changed in a short time. The idea of using third country nationals is obviously an idea that is very controversial but we have to do it because we can't man some of our shops otherwise. That is why we're working to bring in third country nationals to make sure we can get our jobs done."

Not everyone was in agreement. Another panelist responded to the same query on the possibility of immigrants lessening the workforce shortage. He said, "I've been very engaged in this issue. I can adamantly tell you, we oppose the Senate bill. We believe that there are enough people in the United States, given the right set of economics, who would love to work in our industry. Wall Street tells us, 'let the market decide'. Well guess what, we're going to bring in sub-skilled craft workers who will get sub-standard wages and it's going to exasperate the problem."

On June 5, 2007 the U.S. Senate Republicans accused Democrats of trying to rush the vote on immigration reform. The next day the bill failed a crucial test vote, a setback that could spell its defeat for the year. The vote was 45-50 against limiting debate on the bill, 15 short of the 60 that the bill's supporters needed to prevail.

While the bill may now be out of sight, it is most certainly not out of mind. Stay tuned for future issues of The Voice for further developments. If you have an opinion on the bill or any other industry topics, send them to editor@matrixgroupinc.net. ●

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**ASSOCIATIONS/INSTITUTES**

American Institute of Architects (AIA) . . . . .10  
 American Institute of Steel Construction (AISC) . . . . .16  
 The Association for the Advancement of Cost Engineering (AACE) International . . . . .19  
 The Mechanical Allied Crafts Council (MAC) . . . . .26, 27  
 National Association of Women in Construction (NAWIC) . . .50  
 The Association of Union Contractors (TAUC) . . . . .48

**CONSTRUCTION CONTRACTING SERVICES**

Barton Malow . . . . .28  
 Black & Veatch . . . . .49  
 EGIZII Electric . . . . .22  
 Skanska USA . . . . .19  
 Turner Construction Co. . . . .6

**CONSTRUCTION MANAGEMENT & CLAIMS CONSULTING**

Hill International . . . . .30

**CONSTRUCTION PAYMENT MANAGEMENT**

Textura LLC . . . . .inside back cover

**CONTRACTORS & LABORERS RESOURCE GUIDE**

N.W. Laborers & Employers Co-Operation Fund . . . . .inside front cover

**FALL PROTECTION PRODUCTS**

Miller Fall Protection . . . . .39

**INDUSTRIAL CONTRACTORS**

Engineered Companies . . . . .43  
 The Saxon Group Inc. . . . .40

**LABOR MANAGEMENT TRUST**

Impact . . . . .3

**MONEY SAVING SOLUTIONS**

NMAPC National Maintenance Agreements Policy Committee . . . . .23

**PORTABLE STORAGE ASSOCIATION**

National Portable Storage Association . . . . .48

**RISK MANAGEMENT & INSURANCE**

AON Construction Services Group . . . . .12

**TECHNICAL EVALUATION SERVICES**

International Code Council . . . . .18

**UNIONS**

International Union of Painters & Allied Trades . . . . .5  
 National Construction Alliance . . . . .8  
 National Electrical Contractors Association (NECA/IBEW) . . . . .outside back cover

**WEB-BASED PROGRAM MANAGEMENT SOFTWARE**

e-Builder . . . . .32

**WORKFORCE DEVELOPMENT**

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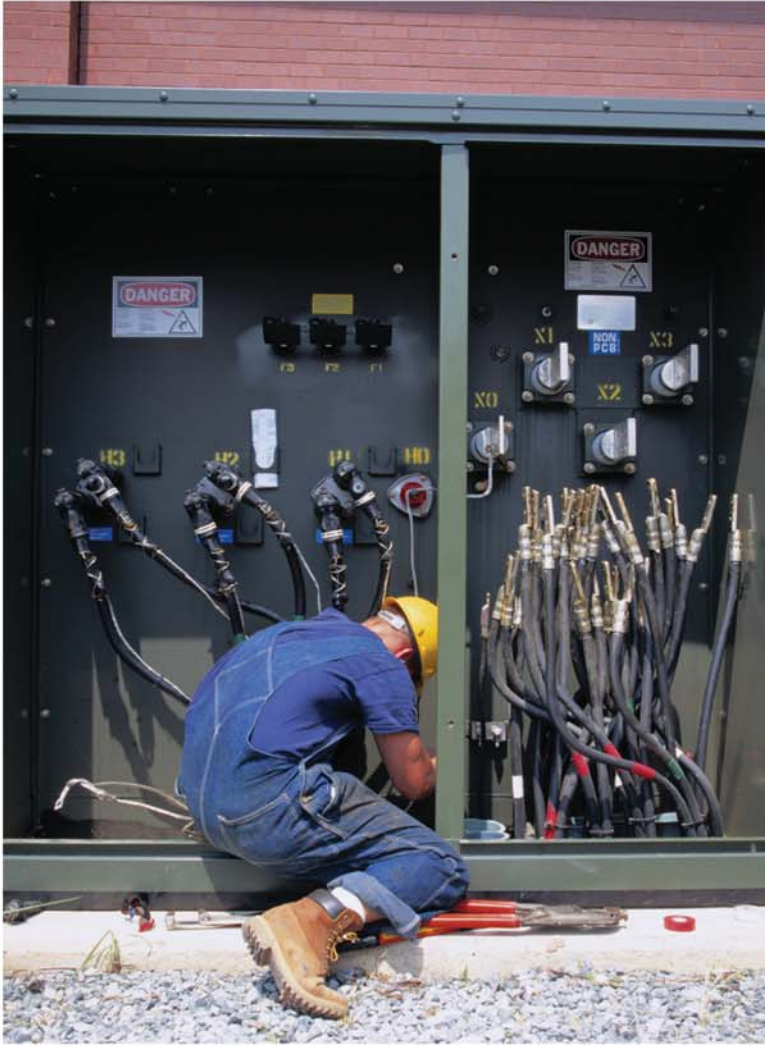
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