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Conference Proceedings

Construction Industry Institute

2002 Annual Conference

Keystone, Colorado

August 7–8, 2002

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The University of Texas at Austin.

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Printed in the United States of America.

Table of Contents

Foreword	v
Building A Secure, Sustainable Future	1
<i>Keynote Address: Charles O. Holliday, Jr.</i>	
The Role of the Construction Industry in Homeland Security	3
<i>Featured Speaker: Arden L. Bement, Jr.</i>	
Zero Accidents: Shutdowns/Outages/Turnarounds	11
<i>Achieving the Zero Injury Objective on Shutdown Projects Project Team</i>	
PPMOF (Prefabrication, Preassembly, Modularization & Offsite Fabrication)	19
<i>Modularization, Preassembly/Offsite Construction Project Team</i>	
Protecting and Preparing the Critical Medical Infrastructure	27
<i>Featured Speaker: Dr. Michael P. Pietrzak</i>	
What Can CII Do for You?	31
<i>First-Time Attendee Orientation</i>	
<i>Implementation Session Only</i>	
Construction Image Update: Whitewash or Change?	35
<i>Featured Speaker: Daniel J. Bennet</i>	
Unlocking CII Knowledge	39
<i>Education Committee and Knowledge Committee</i>	
Integrating CII Best Practices into Project Teams	47
<i>Case Study: Washington Group International</i>	
Construction Technology Needs Assessment	55
<i>Update Technology Needs Research Team</i>	
Capital Projects Supply Chain Management	63
<i>Improving Construction Supply Chain Performance Project Team</i>	
Benchmarking — The Value of Best Practices	71
<i>Benchmarking & Metrics Committee</i>	
<i>Implementation Session Only</i>	
The War on Terrorism	77
<i>Keynote Address: General Richard B. Myers</i>	
Exploring Mutual Interests in Construction Safety and Health	79
<i>Featured Speaker: Dr. Kathleen M. Rest</i>	

e-Commerce — e-Lessons for All <i>e-Commerce Applications for Construction Project Team</i>	83
FIATECH — Building A Comprehensive Technology Agenda <i>FIATECH</i>	91
Onsite Design: When and How Much <i>Evaluating Onsite Design Project Team</i>	97
One Owner’s Project Planning Process Journey <i>Case Study: General Motors</i>	105
Shift in Engineering Responsibility from Owners to Contractors — Has the Pendulum Swung Too Far? <i>Industry Panel</i>	111
Global Trends and Their Impact on Your Business <i>Featured Speaker: Janice L. Tuchman</i>	115
Benchmarking Productivity Metrics <i>Benchmarking & Metrics Committee Implementation Session Only</i>	117
Carroll H. Dunn Award of Excellence	123
Recipients of the Dunn Award of Excellence	125
Dunn Award Recipient <i>Joseph J. Jacobs</i>	127
Outstanding CII Researcher for 2002 <i>Dr. Carl Haas</i>	129
Outstanding CESC Instructor for 2002 <i>Edward M. Ruane</i>	131
Outstanding CII Implementer for 2002 <i>Mohammad S. Al-Subhi</i>	133
Benchmarking User Awards for 2002	135
Securing the Future of America <i>Banquet Speaker: Congressman J. C. Watts, Jr.</i>	139

Foreword

In the post-September 11 reality, we find ourselves dealing with issues that push traditional concerns to the forefront: safety, security, and the ability to respond in a crisis. Prior to 9/11, our industry made steady progress in these areas, but now we all feel a need to do more, to respond more effectively, and above all, to contribute. We see our 2002 Annual Conference as a unique opportunity to present the perspectives of not only some of our premier industry leaders, but leaders of our nation as well.

The conference theme, “CII Contributions to America,” brings our intent and purpose here in Keystone into focus. An impressive lineup of keynote speakers will provide insights into a variety of issues that are at the center of the industry’s collective consciousness. In addition, we have the most recent results from research and member company case studies. These presentations showcase our best practices that are key to the CII mission: improving the construction industry.

Our industry keynote speakers include Chad Holliday, Chairman and CEO of the DuPont Company; Arden Bement, Director of the National Institute of Standards and Technology; Dr. Michael Pietrzak, Project Director of Project *ER One*; Dan Bennet, President of the National Center for Construction Education and Research; and Dr. Kathleen Rest, Director of the National Institute of Occupational Safety and Health. Representing our national interests, we are honored to have Gen. Richard Myers, Chairman of the Joint Chiefs of Staff, who will speak on “The War on Terrorism.” In addition, we will have top industry experts discuss the shift in engineering responsibilities from owners to contractors and answer the question, “Has the pendulum swung too far?” We also will hear the perspective of Jan Tuchman, Editor-in-Chief of *ENR*, who will share her insights on global trends and their impact on business in the aftermath of September 11.

The CII Annual Conference has built a reputation as the premier event in the construction industry. This year’s efforts have resulted in perhaps the finest gathering of speakers, the most intriguing array of perspectives, and a timely set of research findings that truly capture “CII Contributions to America.” We hope you enjoy the conference.



KEN EICKMANN
CII Director



DUANE WILSON
Conference Chair

Building A Secure, Sustainable Future

Keynote Address: Charles O. Holliday, Jr.

Abstract

The construction industry has always had a significant role in sustaining economic growth and improving the quality of life for the world's societies. Innovative materials and technologies will be keys to the construction industry's future contribution to human needs and economic prosperity, but they are not the only challenges. The future success of the industry will depend on being action oriented in areas such as insuring a competitive and capable workforce, minimizing capital and environmental footprints, and delivering inherently safe and environmentally sound processes and facilities. The new realities associated with safety and security will also influence trends, developments and opportunities in the construction industry and industries closely allied with it. Chad will discuss his views on the actions needed by the industry to continue its heritage of contributions and some of the steps DuPont is taking to help insure success.

Keynote Speaker

Charles O. Holliday, Jr. – Chairman & Chief Executive Officer, DuPont

Raised in Nashville, Tennessee, Chad Holliday parlayed a summer job during college with DuPont into a 30-plus year career with the firm. Holliday has touched virtually every DuPont business – from fibers and chemicals to agriculture products and biotechnology. He also has spanned practically all of the company's key functional areas: manufacturing, marketing, finance, planning, and business management. He is the first DuPont CEO with extensive experience outside the United States, having been based in Tokyo, Japan, for seven years as head of DuPont's Asia Pacific operations. Holliday holds a bachelor's in industrial engineering from the University of Tennessee and an honorary doctorate of science degree from Washington College in Chestertown, Maryland.



Building A Secure, Sustainable Future

Plenary Slides

The Role of the Construction Industry in Homeland Security

Featured Speaker: Arden L. Bement, Jr.

Abstract

Since the attack on America on September 11, 2001, the Department of Commerce and the National Institute of Standards and Technology have taken significant actions for homeland security. This presentation will describe those actions and activities and stress the importance of the partnership between CII and NIST, and in particular the Building and Fire Research Laboratory, in providing cost-effective safety and security for buildings and the physical infrastructure.

Featured Speaker

Arden L. Bement, Jr. – Director, National Institute of Standards & Technology

Arden L. Bement, Jr., oversees an annual budget of \$819 million and an onsite research and administrative staff of 3,000. He previously served as the David A. Ross Distinguished Professor of Nuclear Engineering and head of Nuclear Engineering at Purdue University. His 39-year career prior to joining the Purdue faculty included research, executive, and technology positions with TRW, GE, NASA, and Battelle Northwest Labs among others. Bement, a member of the National Academy of Engineering, holds an engineer of metallurgy degree from Colorado School of Mines, a master's in metallurgy engineering from the University of Idaho, and a Ph.D. in metallurgy engineering from the University of Michigan.



Implementation Session Moderator

Jack E. Snell – Director, Building and Fire Research Laboratory, National Institute of Standards & Technology

Jack Snell is the author and co-author of numerous papers, articles, and reports on fire research, energy conservation, and transportation systems. At CII, he currently serves on the Strategic Planning Committee and the Breakthrough Strategy Committee. Snell's career has been noteworthy and expansive. For example, he has been a visiting professor at the Indian Institute of Technology in Kampur, India, as well as an aircraft maintenance engineer for Pan Am Airways. He is a recognized authority in fire research and is past chairman of the Forum for International Cooperation on Fire Research. He holds an aeronautical engineering degree from Princeton University, and a degree in industrial engineering as well as a Ph.D. in civil engineering from Northwestern University.



Implementation Session Participants

Arden L. Bement, Jr. – Director, National Institute of Standards & Technology

Harvey M. Bernstein – President & Chief Executive Officer– Civil Engineering Research Foundation

James Crum – Director of Critical Infrastructure Restoration, Office of Homeland Security

C. Hilton Dunn – Director of Federal Programs, BE&K Engineering Company

The Role of the Construction Industry in Homeland Security

by Arden L. Bement, Jr.

It has become a cliché to say that 9-11 changed everything. Like most clichés, the assertion is an overstatement. And like all clichés, there is a lot of truth to the statement. That is certainly the case for the construction and building communities. Where security considerations were primarily a special consideration for certain classes of buildings — including correctional facilities, embassies, and important military installations — the terrorist attacks of 9-11 have moved the security and safety of buildings and other constructed facilities much higher up in the hierarchy of design, construction, operation and maintenance, and use concerns. The attacks have shined the national spotlight, sometimes harshly, on the role of the construction industry in homeland security. The industry has the opportunity to respond vigorously and with a sense of commitment that will help the nation become safer and more secure in an era of increased danger.

The conditions under which nearly 3,000 building occupants and emergency responders perished in the World Trade Center complex, in particular, has the potential for shaking the very foundations of how building standards, codes and practices are developed and implemented in this country — and perhaps around the world. There is a grassroots effort being led by the families of victims who died in the buildings — either as occupants who could not escape or emergency responders who themselves became victims in the fire and collapse. These families have joined together in a campaign with two goals. First, they are supporting an investigation of the building collapses and how the occupants and first responders' fates were tied to the design, construction, operation and maintenance, and use of the buildings. Second, they seek an overhaul of the nation's building standards and codes to address several of their major concerns about the safety of all tall buildings. This effort is well organized and has been effective in capturing the attention of federal decision makers and the news media. Their initiative is one of the reasons why the National Institute of Standards and Technology (NIST) is being called upon to conduct an investigation into the World Trade Center building and fire disasters. It is incumbent on the construction community to give their concerns close attention.

The investigation, which will take approximately 24 months from its official start until final recommendations are made, is one part of the three-pronged NIST response to the fire and building disaster. All three elements build on the Federal Emergency Management Agency-sponsored building performance assessment team report led by the American Society of Civil Engineers. It also benefits from the endeavors of the National Science Foundation's academic grantees.

The investigation addresses building and fire codes and practices; baseline structural performance and aircraft impact damage analyses; mechanical and metallurgical analyses of structural steel; investigation of active fire protection systems; reconstruction of thermal and tenability environment; structural fire response and collapse; occupant behavior, egress, and emergency communications; and fire service technologies and guidelines.

In addition, NIST is undertaking a research and development program that will turn findings and recommendations from the investigation into a solid technical basis for improved practice, standards, and codes. This R&D will cover structural fire protection; human behavior, emergency response and mobility; and a broader range of issues associated with reducing the vulnerability of buildings to disaster.

The third part of our response to the World Trade Center disaster is needed to assure that the lessons learned actually get adopted into practices — a dissemination and technical assistance program. The key to changing practice, standards and codes is active support from and participation by industry and the other groups that work together in the voluntary consensus standards-making process. As part of that effort, NIST will be participating in and supporting TISP — The Infrastructure Security Partnership, a private-public venture that will facilitate the national dialogue on domestic infrastructure security and offer sources of technical support and comment on public policies. NIST and CII now are both involved in TISP.

Is this three-part NIST response due entirely to the World Trade Center disaster and to the heightened threat of terrorist attacks? Clearly, NIST's work in this area — and that of the many partners who will be assisting us with our efforts — reflects a concern about possible future attacks. But our work goes well beyond that horrible scenario. We saw the collapse of several buildings during major fires, something that we had never seen before. Even though thousands upon thousands of building occupants were able to escape the towers while they burned, we saw problems with the evacuation of thousands more. We need to know more about the design, construction, operation and maintenance, and use of these buildings so that we can improve public safety and better protect our occupants, emergency responders, and property — regardless of the source of fire. Cost-effective solutions will require us to consider multi-hazard approaches to natural, technological, and terrorist threats. The obvious public interest in these issues will mean that the entire building and construction community must be ready, willing, and able to address those concerns as we take on the toughest challenges of the next several years.

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The Role of the Construction Industry in Homeland Security

Plenary Slides

Zero Accidents: Shutdowns/Outages/Turnarounds

Achieving the Zero Injury Objective on Shutdown Projects Project Team

Learning Objectives

- Learn which practices contribute most to improved safety performance on shutdowns and turnarounds.
- Discover key differences between short-term work and conventional projects.
- Gain insights into technology used on the most successful short-term work projects.
- Learn which practice is the single most important to achieve zero accidents.

Abstract

When establishing CII in 1983, the charter members cited improvement of safety as one of the founding principles. With OSHA-supplied data, CII has maintained a comparison of aggregate CII safety performance over the past 12 years. Marked improvement in safety performance has been noted by the industry overall, but the safety improvements by CII member companies is even more impressive: one-sixth the number of industry recordables and one-tenth the number of lost workday cases.

This presentation builds on research from the CII Making Zero Accidents a Reality Project Team, which identified nine safety management elements that has led to major safety performance improvements. This follow-on CII project team will report on safety management approaches utilized on turnarounds and shutdowns that have positively impacted safety performance during rapid buildup of the workforce and around the clock scheduling.

Plenary Session Presenter

John J. Mathis – Safety Services Manager, Bechtel Corporation

John Mathis has over 25 years of experience in the construction industry. His environmental, safety, and health (ES&H) assignments have included managing safety across a broad range of business units that include nuclear and fossil power, petrochemical, mining and metals, and infrastructure projects. He has held positions as Regional Manager of Safety and Health, Manager of ES&H for Bechtel's BECON Construction Company and ES&H Manager covering all of Bechtel's work in North America. Mathis has been recognized as a leader in Bechtel's drive to achieve and sustain "Zero Accidents" on a worldwide basis and has played a major role in the development of the current ES&H management system tools and processes.



Implementation Session Moderator

John J. Mathis – Safety Services Manager, Bechtel Corporation

Implementation Session Participants

Mike Dicarlo, Construction Manager – Becon Construction Co.

Wayne King, Site Manager – Watkins Engineers & Constructors

Carl E. Lake, Manager of Construction – Bechtel

Gene Sanders, Contract Manager – Austin Industries

Zero Accidents: Shutdowns/Outages/Turnarounds

Achieving the Zero Injury Objective on Shutdown Projects Project Team

This research project was an extension of a prior CII research effort (2001) entitled Making Zero Accidents A Reality that focused on effective safety practices on large construction projects. This follow-on research effort focused on short duration projects that are commonly referred to as shutdowns, turnarounds or outages. While different sectors of the construction industry use these terms interchangeably, the term shutdown is most common and will be used here.

Shutdowns take place in operating facilities where the operations are temporarily suspended in order to perform major modifications or major repairs. When shutdowns occur, the revenue normally generated by the production of the facility is halted. For this reason, the shutdown work needs to be performed quickly in order to make the facility operational as soon as possible. Shutdowns are different from most construction projects as they require a quick buildup of the work force and are performed under tight time constraints. Shutdowns are generally performed with more than one shift and six or seven-day workweeks are common. The importance of planning and scheduling is particularly acute on shutdowns for these reasons.

This research was conducted by interviewing contractor personnel on 44 different shutdown projects. The shutdown projects had impressive safety performance records. The median injury rate for these projects was less than 0.7 OSHA recordable injuries per 200,000 worker hours of exposure. In addition, 50% of the projects reported having achieved zero OSHA recordable injuries. While these projects all had safety performance records well below the national average for the construction industry, differences between the safety performances of these shutdown projects were found to be associated with the differences in their work practices.

There are indeed unique aspects of shutdown projects that warrant particular concern. Shutdown projects are characterized by the short-term need for workers to perform the shutdown work. After the shutdown work is completed, the services of the workers are no longer needed. Shutdown projects with better safety records were those that were successful in transferring workers from other projects to perform the work. This familiarity with the work reduces the complications of orienting workers in a short time. Because the shutdown work is of such short duration, scheduling is important. Safer performances were noted on projects that were scheduled by using time units of hours, instead of shifts or days.

Better safety performances were also noted on projects that began hiring workers earlier (a few weeks before the shutdown) for major shutdown work as opposed to hiring just immediately (a week or two before the shutdown) before the shutdown actually took place. Since the work must be done in a short time, it is a common practice to work overtime. It also is common for projects to regularly work two shifts of ten-, eleven- or twelve-hour workdays, and for projects to work six or seven days each week. Results indicate that safer performances resulted when shorter workweeks were worked and when shutdown durations were shorter in length, especially less than two weeks. It was also found that projects have better safety performance records when crews were smaller and when projects were completed under incentivized contracts.

The prior CII research project, *Making Zero Accidents A Reality*, found that safety on large construction projects is influenced by practices that were grouped into nine different categories. This follow-on research effort found support for the nine categories. It was noted that virtually all projects had management commitment and that safety staffing was also strong on all projects (see 1 and 2 below). The remaining seven key topic areas varied between the projects and showed clear influences of these factors on safety performance. The nine categories are:

1. Demonstrated management commitment
2. Safety staffing
3. Planning: pre-project and pre-task
4. Safety education: orientation and specialized training
5. Worker involvement
6. Evaluation and recognition/reward
7. Subcontract management
8. Accident/incident investigations
9. Drug and alcohol testing

The findings of the study on shutdowns are consistent with the findings of zero accidents research. The research concluded that there is no simple or singular solution to achieving zero injuries. That is, there is no single practice that makes a tremendous difference in safety performance in the absence of the other practices, and no quick fix exists in order to achieve excellent safety performance.

Zero Accidents: Shutdowns/Outages/Turnarounds

Achieving the Zero Injury Objective on Shutdown Projects Project Team

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Zero Accidents: Shutdowns/Outages/Turnarounds

Plenary Slides

PPMOF (Prefabrication, Preassembly, Modularization & Offsite Fabrication)

Modularization, Preassembly/Offsite Construction Project Team

Learning Objectives

- Learn when and how to evaluate the use of PPMOF in pre-project planning and the project life cycle.
- Learn how to optimize the use of PPMOF tools.
- Capitalize on emerging enabling technologies.
- Improve project schedules and reduce costs.

Abstract

New technologies, skilled labor availability issues, and the impact of the supply chain have led to an increased interest in PPMOF. Earlier decision-aid tools now have given way to this CII project team's development of a tool to enhance the PPMOF decision-making process.

Recent changes in the industry have had an impact on the use of PPMOF. Both the drivers and the barriers to PPMOF will be outlined in the plenary presentation. The implementation session will feature an interactive experience on how to use the PPMOF decision tool based on a case study example.

Plenary Session Presenter

B. J. Lewis – Senior Vice President of Global Marketing, Chicago Bridge & Iron Company

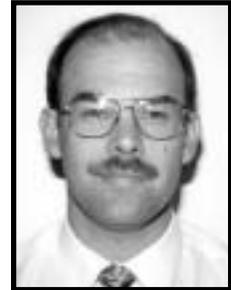
Bob Lewis joined Chicago Bridge & Iron immediately upon graduation and now has over 34 years' experience with CBI and its subsidiaries. Assignments have included corporate business development and regional sales manager among many others, primarily in the firm's offices in Houston, Texas. Lewis also has had assignments in CBI offices in Illinois and Louisiana, as well as international experience in the United Kingdom and Saudi Arabia. He currently chairs the CII project team performing research on prefabrication, preassembly, modularization, and offsite fabrication. Now based at CBI offices in The Woodlands, Texas, Lewis holds a bachelor's degree in civil engineering from Texas Tech University.



Implementation Session Moderators

Robert J. McCabe – Process Manager, Primary & Tubular, U.S. Steel

Bob McCabe joined U.S. Steel immediately after graduation and has 23 years of experience in the area of project execution. His experience includes projects in seamless pipe production, iron and steel production, continuous casting, and various aspects of sheet steel finishing. McCabe has served in various positions with the Association of Iron and Steel Engineers (AISE), is a former chairman of the Birmingham District Section, and for two years was a National Board of Director member. He holds a bachelor's degree in mining engineering from West Virginia University.



Robert A. Smith – Group Director, Chemicals, Plastics, and Refining, Lockwood Greene

Rob Smith has 21 years of experience in the process industries including engineering, construction, project management, sales, and management roles. His background includes prefabrication, preassembly, modularization, and off-site fabrication through his experience in an owner organization, a major module facility, and in EPC organizations. His experience also includes EPC projects using PPMOF techniques in the chemical, petroleum, power, mining & metals, and the pharmaceutical/biotech industries. Smith holds a bachelor's degree in Mechanical Engineering from Texas A&M University and is a Registered Professional Engineer in Louisiana.



Implementation Session Participants

Anthony Scott Flately, Assistant to the CEO – BE&K

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Wayne Sykes, Resident Construction Manager – Kværner

Terry S. Wilford, Civil Engineer – U.S. Army Corps of Engineers

Paul M. Wood, Engineering Consultant – Eli Lilly and Company

PPMOF (Prefabrication, Preassembly, Modularization & Offsite Fabrication)

Modularization, Preassembly/Offsite Construction Project Team

Prefabrication, preassembly, modularization, and offsite fabrication, or PPMOF, offers potential benefits that are more important than ever in today's markets. Owners want better facilities faster, at the lowest possible cost, and always safer. For the right project conditions, PPMOF can help achieve the owners' goals. The results described here build on and extend prior CII work on this subject and is based on industry drivers that strongly favor increased use of PPMOF.

PPMOF can help project teams meet the challenges of demanding schedules, adverse site conditions, and limited availability of skilled labor. Using PPMOF methods, however, requires careful consideration of the implications for engineering, transportation, coordination, and project organization. The advantages that can result from using PPMOF, on appropriate projects, are improved performance in meeting business objectives and reduced risk.

Managers considering PPMOF need a systematic method to evaluate the potential benefits and barriers to using these special methods. In 2000, CII formed the Modularization, Preassembly/Offsite Construction Project Team (PT 171) to update and extend prior CII research efforts and to help improve project performance through use of PPMOF. The project team first focused on identifying the requirements for effective use of PPMOF on industrial projects and then developed a framework to use as a decision aid with these methods. The framework includes a decision-timing map, flow chart, tools for strategic analysis, and suggestions for a more detailed tactical analysis.

The successful CII Project Definition Rating Index , or PDRI, has improved project performance; the PPMOF analysis framework can bring similar benefits in evaluating possible use of these special methods.

PPMOF is not for every project, but it can bring major performance improvements for projects deemed appropriate for these techniques. How does one decide that a particular project is appropriate for PPMOF? Consider using the framework described at this conference, which will allow the experience of many seasoned PPMOF users to come into the decision-making. Then, if the project fits, apply PPMOF and realize the benefits.

References

The research team has published several products upon approval of the CII production review board to document this research:

- *Prefabrication, Preassembly, Modularization, and Offsite Fabrication in Industrial Construction: A Framework for Decision-Making*, Research Summary 171-1, Construction Industry Institute, Austin, TX, July 2002.

- *Implementing the Prefabrication, Preassembly, Modularization, and Offsite Fabrication (PPMOF) Decision Framework: Guide and Tool*, Implementation Resource 171-2, Construction Industry Institute, Austin, TX, July 2002.
- “Preliminary Research on Prefabrication, Preassembly, Modularization and Offsite Fabrication in Construction,” Research Report 171-11, Construction Industry Institute, Austin, TX, July 2002.
- “Development of A Decision-Supporting Tool for Prefabrication, Preassembly, Modularization, and Offsite Fabrication,” Research Report 171-12, Construction Industry Institute, Austin, TX, August 2002.

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PPMOF (Prefabrication, Preassembly, Modularization & Offsite Fabrication)

Plenary Slides

Protecting and Preparing the Critical Medical Infrastructure

Featured Speaker: Dr. Michael P. Pietrzak

Abstract

Today's world environment poses many threats — natural, accidental, or deliberate (most notably — acts of terrorism). The notion that hospitals or Emergency Departments are immune or protected from such events is no longer tenable. While many elements of the nation's critical infrastructure must be protected in order to remain functional during a crisis, medical facilities will need to be "super-functional" at these times. Project *ER One* was initiated to develop the design features that will make medical facilities protected, more functional to treat the potential presenting injuries and illnesses, and able to deal with increased volume. This presentation will explore the design features, materials, and technologies that new generation medical facilities will require to meet national security needs.

Featured Speaker and Implementation Session Moderator

Dr. Michael P. Pietrzak – Project Director, Project *ER One*, Washington Hospital Center

Dr. Michael Pietrzak is the founder and principal of Knowledge Management Solutions, a consulting firm working in the areas of medicine, security, and technology application. Dr. Pietrzak is the Director of Project *ER One*, a federally funded initiative developing the design features, concepts, and specifications for the "all risks" medical facility in the multi-threat environment. He had a distinguished military career, where he was involved among other issues with medical facility design as well as clinical oversight. He coordinated the clinical integration of all Department of Defense treatment facilities in the Southwest U.S., including the two largest, Wilford Hall and Brooke Army Medical Center, both of which are in San Antonio, Texas. He has held several academic positions, including assignments at Georgetown University and George Washington University. General Colin Powell, Chair of the Joint Chiefs of Staff in 1993, presented Dr. Pietrzak with the first Joint Chiefs Award for Excellence in Military Medicine.



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Protecting and Preparing the Critical Medical Infrastructure

Plenary Slides

What Can CII Do for You?

First-Time Attendee Orientation — Implementation Session Only

Learning Objectives

- Learn how CII answered industry's call for a research clearinghouse and a unified vision for improvement.
- Gain a better understanding of CII and its current and future activities.
- Learn specific details of CII programs on research, implementation, and education (both online and university short courses), as well as other efforts in benchmarking, breakthrough, and globalization.
- Listen to how CII member companies have benefited from the implementation of CII tools and practices.

Abstract

This implementation session is designed for those who want to know more about how CII is organized and how its various efforts to improve the industry are generated and accomplished.

Director Ken Eickmann will provide an overview of CII's origins, its mission and vision, and its core processes. A stellar panel of member representatives will then provide expert insight on how CII provides not only much-needed research for the industry, but an opportunity for networking and personnel training that is impossible to obtain in any other setting.

Implementation Session Moderator

Kenneth E. Eickmann – Director, Construction Industry Institute

Prior to joining CII as Director in September 1998, Ken Eickmann (Lt. Gen., U.S. Air Force, Retired) enjoyed a distinguished and highly decorated 31-year career in the U.S. Air Force. Ken is a Registered Professional Engineer and a Certified Acquisition Professional in acquisition logistics, program management, and systems planning, research, development, and engineering. He is a Senior Lecturer in Civil Engineering at The University of Texas at Austin. In 1999, he was named a Distinguished Graduate of the UT Austin College of Engineering. He holds a bachelor's degree in mechanical engineering from UT Austin, a master's degree in systems engineering from the Air Force Institute of Technology, and is a graduate of the University of Michigan School of Business and the John F. Kennedy School of Government, Harvard University.



Implementation Session Panelists

Joan M. Dodd, Senior Manager, Transmission/Power Supply – Tennessee Valley Authority

Bernard J. Fedak, General Manager, Engineering – U.S. Steel Group

Donald E. Sundgren, Chairman, President & Chief Executive Officer – Dillingham Construction Corporation

John B. Zachry, President – Zachry Construction Corporation

What Can CII Do for You?

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What Can CII Do for You?

What Can CII Do for You?

Implementation Session Slides

What Can CII Do for You?

Construction Image Update: Whitewash or Change?

Featured Speaker: Daniel J. Bennet

Abstract

The image of the construction industry ranks at the bottom of the class when compared to other industries. In September 2000, a historic meeting took place in Atlanta when more than 150 contractors, owners, associations, and unions gathered to address the issue.

A presentation was given at the last CII Annual Conference outlining the problems and giving a blueprint for what needed to be done. Since that meeting, committees have been formed, meetings held, and initiatives started. More than 125 people are actively involved in the effort.

This presentation will outline specific image objectives and projects and detail their implementation.

Featured Speaker

Daniel J. Bennet – President, National Center for Construction Education and Research (NCCER)

Dan Bennet was Executive Vice President of the Associated Builders and Contractors from 1983 to 1997. He also was a member of the Construction Industry Cost Effectiveness Project, a five-year study of the industry by The Business Roundtable that led to the creation of CII. Widely recognized as a leader in the construction industry, Dan has been honored many times for his efforts to improve the industry. He received CII's highest honor, the Carroll H. Dunn Award of Excellence, in 1995. He directs the activities of the NCCER from its offices at the University of Florida in Gainesville.



Knowledgeable Point of Contact

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Construction Image Update: Whitewash or Change?

Construction Image Update: Whitewash or Change?

Plenary Slides

Construction Image Update: Whitewash or Change?

Unlocking CII Knowledge

Education Committee and Knowledge Committee

Learning Objectives

- Raise company awareness of CII Best Practices and the Knowledge Structure.
- Learn how to provide a common level of understanding of a CII practice for your entire project team, including business sponsors.
- Learn how to obtain a password to access the CII Products Online.
- Take advantage of the member-only CII Products Online service that provides product access and distribution 24/7, worldwide.

Abstract

With over 300 research reports published since 1986 and online access via the CII Web site now a reality, browsing through the virtual CII library could be overwhelming. Fortunately, CII has developed the Knowledge Structure to make browsing the CII library of summaries, reports, and implementation resources fast and easy. This presentation will explore the Knowledge Structure and its use at the CII Web site (construction-institute.org), which enables registered users to log in and view the hundreds of CII reports via Products Online.

The presentation also will explore other avenues to CII information: CII's Construction CD-ROM 5.0, the Continuing Education Short Courses, Technology Assisted Learning, and more.

Plenary Session Presenter

Chris W. Hyvonen – Senior Vice President, Power and Process Division, Kiewit Industrial Company

At Kiewit, Chris Hyvonen is responsible for business development and marketing for engineering and construction projects in the power and process sector. He has more than 27 years experience in the construction industry with assignments in strategic planning, business and finance, and corporate development. Hyvonen is co-chair of the CII Education Committee. He earned BA, bachelor of engineering, and MBA degrees from Dartmouth College in Hanover, New Hampshire.



Implementation Session Moderator

Freddie P. Wong – Senior Project Engineer, Aramco Services Company

Freddie Wong, born in Shanghai and raised in Hong Kong, is a Senior Project Engineer for Aramco Services Company in Houston, Texas. He currently is responsible for the training program for all Aramco technical services personnel, including the intern program for Saudi Arab nationals assigned to host companies in the United States and Canada. With Aramco since the mid-1970s, Wong has served as engineering specialist, project engineer, project design manager, and administrator. He also worked on the joint venture of Saudi Refining, Texaco, and Shell. For the past several years, he has been active with the CII Education Committee. Wong holds a bachelor's degree in electrical engineering from Texas A&M University as well as a Doctor of Jurisprudence degree.



Implementation Session Participants

Virgil L. Barton, Manager of Quality Services – Bechtel

C. Jerome Eyink, Senior Manager, Engineering Contracts & Procurement – Anheuser-Busch Companies

Lawrence E. Scott, Jr., Manager, Capital Effectiveness – U.S. Steel

Unlocking CII Knowledge

Education Committee and Knowledge Committee

The key points are:

1. CII has developed valuable project management knowledge which, when effectively applied, can bring about significant improvements in the performance of capital facilities projects.
2. The CII knowledge is arranged in a knowledge management system known as the CII Knowledge Structure.
3. The Knowledge Structure may be accessed via the CII Web Site using the address <http://construction-institute.org>. Click on “Catalog”, click on “Knowledge Structure”. The matrix is an interactive catalog. Click on any entry to obtain a listing of products and additional information.
4. CII members may use the CII Products Online system to access and download Research Summaries, Implementation Resources, Research Reports, and Benchmarking Publications. Instructions have been provided to each member organization to enable the distribution of user names and passwords to allow downloading the content of the CII products noted. A listing of the Online Administrators for CII member organizations is included in the Proceedings Appendix. Nonmembers may use the catalog but are not able to download products at this time. An e-commerce system to allow nonmember purchases and downloads of products is planned.
5. Two new publications: *Implementation Model + Knowledge Structure Guide*, IR 166-2, and *CII Best Practices Guide*, IR 166-3, provide considerable information about the Knowledge Structure, the CII Implementation Model, and the CII Best Practices. Both of these documents should be on every Project Manager’s reference shelf.
6. CII educational resources fall into three categories:
 - a. Education Modules provide complete training solution packages on the most important research products. These are described in the Knowledge Structure and may be purchased through the Catalog. Because of their complexity, the education modules are not available for download. A listing of the 20 current modules is provided in the Appendix.
 - b. Arizona State, Clemson, and The University of Texas at Austin provide Short Courses that use CII education modules. These universities are also available to provide customized delivery of CII education subjects. Information on the content and schedule of these Short Courses is available in the Appendix and on the CII Web site at <http://construction-institute.org>. Click on “Short Courses” on the left navigation to access this information.

- c. A partnership between CII and EduNeering, Inc., provides a growing list of CII Education Modules as highly developed computer interactive courses through a subscription program. This system also makes available a number of industry-related training courses and a learning management system. Additional information is available in the Appendix. To contact EduNeering, call or e-mail Joanne Vest at (281) 709-0917 or jvest@eduneering.com. You may access the EduNeering Web site at <http://www.eduneering.com>.
7. Member organizations should ensure they have empowered their employees at all appropriate levels to obtain and apply the CII Knowledge. This includes widely distributing the user names and passwords for the Products Online system, encouraging maximum use of the CII Knowledge Structure, and insuring that IRs 166-2 and 166-3 are available to all project managers and other interested employees. By taking these simple measures, member organizations will be giving their employees The Keys to CII Knowledge. Great things can happen when employees are empowered!

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Unlocking CII Knowledge

Plenary Slides

Integrating CII Best Practices into Project Teams

Case Study: Washington Group International

Learning Objectives

- Learn about the WGI Project Team Development Program — what it is and why it was undertaken.
- Understand the methodology for integrating CII Best Practices into project team performance.
- Benefit from the lessons learned and see how barriers were overcome.
- Learn about the cost and the benefits of the program.
- Hear the perspectives of various participants in the program.

Abstract

This presentation will introduce a methodology to consistently integrate CII Best Practices into company work processes to improve project team performance. Starting with the management mandate to begin the program, learn how the steering team guides the effort, and the role of the Clemson University academics who assisted Washington Group International (WGI) personnel in developing the training modules. Panelists from WGI will review the implementation processes developed and the lessons learned. Also, a CII owner representative as well as WGI employees who have participated in the program will give their perspectives.

The WGI program currently covers 26 topics totaling 184 classroom hours. The training is presented in two phases: a Web-based course to be completed online as a prerequisite to the second phase of classroom training with case studies and team exercises.

Plenary Session Presenter

Michael M. Cate – Director, Procurement, Washington Group International

Mike Cate, recently transferred to the Denver offices of WGI, has 36 years with the company, including both foreign and domestic assignments. Functional responsibilities have included engineering, procurement, project management, and field assignments. He currently is the Corporate Functional Leader for procurement throughout all of WGI. Cate's association with CII began in 1986 as a member of the CII Contracts Research Team. Since then, he has been involved in numerous CII research teams and was a speaker at the 1993 Annual Conference. He is principal author of two CII publications on disputes prevention and resolution, and currently serves on the CII Knowledge, Research, and Education committees. Cate holds an electrical engineering degree from the University of Tennessee.



Implementation Session Moderator

Michael R. Peters – Training Manager, Industrial/Process Business Unit, Washington Group International

Mike Peters is working with professors from Clemson University in developing education modules that utilize CII best practices. These modules are used to train personnel throughout the company. He formerly was an educational consultant for Sprint, working on its curriculum for new hires in that firm's centers in Denver, Portland, Kansas City, and Albuquerque. A collegiate basketball player and golfer, Peters is a former golf pro for the Blue Springs Country Club in Missouri and has served on several committees of the Professional Golfers' Association of America (PGA). Based with WGI in Cleveland, Ohio, Peters earned a bachelor's degree in communications from Drury College, Springfield, Missouri.



Implementation Session Participants

W. Edward Back, Assistant Professor – Clemson University

Robert J. Beaker, Manager, Powertrain and Non-Manufacturing Projects and Project Management Process – General Motors Corporation

Michael M. Cate – Director, Procurement, Washington Group International

Ruthie Edmondson, Contracts Engineer – Washington Group International

Thomas M. Searl, Project Manager – Washington Group International

Integrating CII Best Practices into Project Teams

Case Study: Washington Group International

The Washington Group International (WGI) Project Team Development Program Steering Team has developed a methodology to consistently integrate CII Best Practices and Proposed Best Practices into company work processes to improve project team performance. The program, which is built on existing WGI work processes, is enhanced by the integration of CII Best Practices into those standard work processes through training. The vision is to develop outstanding project personnel and communicate project delivery best practices resulting in consistent, outstanding project performance.

The effort began in November 1999. Currently, the training modules cover 26 topics totaling 184 classroom hours. Each module, which is developed by a WGI Subject Matter Expert (SME) who works closely with academics at Clemson University, uses a 12-step development process. Experienced WGI personnel support the SMEs. The steering team is involved in four of the steps in module development:

1. Approval of the learning objectives
2. A detailed content review of the module prior to pilot
3. Review and comment on the pilot course held for each module
4. Approval of any changes to the module recommended by the SME under the program's continuous improvement process.

The program, designed by key project team members, includes client personnel. This allows all to understand and gain an appreciation for the responsibilities and contributions of each team member toward a successful project. It is being institutionalized throughout the company through training.

The training is two-phased. In the first phase, a Web-based course is completed online as a prerequisite to facilitated classroom training with case studies and team exercises. Then, the Facilitator Training and Certification Module is used to develop WGI employees to be the facilitators for the "balance of module" workshops. This method of delivery provides numerous benefits including less time away from the project for participants and more cost-effective, efficient, and effective training. Selection for participation in the program is a collaborative effort between an employee and his or her supervisor or mentor.

The training is conducted at convenient and cost-effective locations both at regularly scheduled intervals and as required by project teams. It is modularized into 26 discrete topics so that training sessions can include several topics and can be custom-designed to cover the particular subjects needed most by the team members at any particular stage of a project.

Over the past two years, hundreds of WGI project team members have begun implementing CII Best Practices on their projects. In 2001, over 1,000 participants received a total of 12,000 Project Team Development Program (PTDP) training hours. Through June 2002, over 450 participants have received 5,500 PTDP training hours.

The success of this program validates the effectiveness of the CII Implementation Model provided in *A Guide to the CII Implementation Model and Knowledge Structure* (CII Implementation Resource 166-2). WGI has essentially completed the first five steps of the implementation model and is well into the last four steps. Performance on projects has improved where key team members, who are recognized and rewarded at four defined levels, have participated in the program.

Better methods are being developed by the steering team to measure both the utilization of best practices and the impact of their use on projects. To accomplish this, WGI is using the recently published *Implementation of CII Best Practices* (CII Implementation Resource 166-3). It includes a checklist/questionnaire for each Best Practice to use as a method of evaluating the degree of implementation at either a project or organizational level.

This program is crucial for the current and future success of the company, which is focused on employee development, operational excellence, and financial performance. It is driven from the “top down” as well as the “bottom up.” Clients have shown a great deal of interest and are invited to have key members of their project teams participate in the training and implementation of best practices. This program also provides the team training and best practice implementation necessary for WGI to institutionalize its approach to all projects and realize the goal of consistent, outstanding project performance.

Integrating CII Best Practices into Project Teams

Case Study: Washington Group International

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Integrating CII Best Practices into Project Teams

Plenary Slides

Construction Technology Needs Assessment

Update Technology Needs Research Team

Learning Objectives

- Learn about the construction industry's technology needs.
- Discover how different groups within the industry assess the needs differently and why.
- Examine how the industry's current technology implementation can be improved.
- Find out the steps of the Technology Implementation Cycle and how existing industry groups can use it.

Abstract

CII formed the Update Technology Needs Project Team to focus on field operations and to identify areas that can be improved by technology. A review of the industry's current needs will be provided, along with an explanation as to why various groups see the needs differently.

This presentation will introduce the Technology Implementation Cycle for construction and show how the current "batch process" must change into a continuous, market-driven process to meet the industry's technology needs of the future. The team's vision of how the industry might get ahead of the technology curve will be offered.

Plenary Session Presenter

Gareth V. Williams – Project Manager, Bechtel Corporation

Gareth Williams is based in Houston, Texas. He has worked on a variety of domestic projects for Bechtel over the past 21 years. He began his career as a construction field engineer in the nuclear sector, and has had assignments in procurement and engineering. He has managed a number of small project programs and from 1999-2001 was a member of the CII Executing Small Projects Research Team. He presented the research findings from that effort last year at both the Annual Conference and the Construction Project Improvement Conference. Currently, Williams chairs the CII Construction Technology Needs Update Research Team. He earned a civil engineering degree from Cornell University, Ithaca, New York, and an MS degree from Rice University, Houston, Texas.



Implementation Session Moderator

Gareth V. Williams, Project Manager – Bechtel Corporation

Implementation Session Participants

Frank Beddings, Manager of Engineering, Hot Mills – SMS Demag

Robert W. Chesi, Supervisory Civil Engineer – U.S. Army Corps of Engineers

W. L. Fecht, Senior Construction Manager – Phillips Petroleum Company

Edgar O. Hanley, Regional Mechanical Engineer – U.S. Department of State

Robert Powers, Jr., Process Design Coordinator – BE&K Engineering Company

Michael C. Vorster, Professor, Department of Civil & Environmental Engineering –
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Construction Technology Needs Assessment

Update Technology Needs Research Team

While the construction industry is a major user of technology in all of its construction activities, it is for the most part a passive user. Prospects for future industrial development point to a growing use of technology in all sectors. Currently, however, technology is predominantly developed in other industries and may later be adopted and modified by the construction industry without much structure and guidance. The construction industry lacks a clear definition of technologies that are needed to achieve excellence in cost, schedule, safety, and quality. Knowledge of such needs will improve the development and adoption of beneficial technologies.

Scope and Purpose

The purpose of the CII study undertaken by this research team is to identify technology needs. This study updates previous needs assessments, e.g., those done by The Business Roundtable in 1982 and by CII in 1992. Emphasis here was placed on automated and semi-automated field construction methods and equipment. Opportunities in IT were also included in the scope, but did not dominate it. The research focused on technology needs as distinct from technology availability and therefore the team did not seek to develop a technology database.

Objectives of the Research

- Develop a comprehensive list of industry-wide needs for construction technology.
- Develop mechanisms for disseminating identified technology needs.
- Effect a change in interfacing between the construction industry and providers.

Research Findings

The survey results clearly identified two work processes to improve through technology:

- **Onsite Information Flow:** Providing drawings, specifications, and other work management information to the labor at the work site.
- **Field Materials Management:** Tracking, locating, finding, and distributing the right material to the right location at the right time.

These technology needs areas are consistent with technology goals identified by the FIATECH consortium in its “Capital Projects Technology Roadmapping Initiative.”

Key Conclusions

- The construction industry is fractured and seriously lagging behind other industries in terms of using innovative technologies.
- Barriers prevent effective implementation and adoption of new and existing technologies; the work force prefers the “tried and tested way,” but lacks “technology savvy.”

- CII Knowledge Areas 4, Construction, and 5, Start-Up & Operation, have the most potential.
- A clear, positive cost-to-benefit ratio is the most important technology attribute. Abilities to improve safety and to augment a skills shortage in the work force are also desirable.
- IT should be used to connect project participants and access all project information at any time from any location.
- Stronger ties need to be established between companies and technology providers. Lack of cooperation is compounded by the fact that most companies do not perform their own technology R&D.
- CII and/or FIATECH should take the lead in the process of technological innovation.

Suggestion for Implementation Efforts

The research team defined a “Technology Implementation Cycle” that describes the continuous process with its barriers and enablers at each strategic interface. It is intended to foster cooperation within the construction industry and communication with technology providers by:

- Improving the identification and prioritization of needs.
- Communicating prioritized needs to technology solutions providers.
- Developing solutions and communicating potentially deployable technologies to users.
- Facilitating the successful implementation of new technologies.

Using the Technology Implementation Cycle will place the construction industry in a proactive mode to lead the development of technologies that support its own articulated needs.

Construction Technology Needs Assessment

Update Technology Needs Research Team

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Construction Technology Needs Assessment

Plenary Slides

Capital Projects Supply Chain Management

Improving Construction Supply Chain Performance Project Team

Learning Objectives

- Understand the complexities of managing the capital projects supply chain.
- Discover the potential benefits of successful SCM.
- Learn about the required competencies and key enablers of capital projects SCM.
- Learn how to align business and supply chain objectives.

Abstract

This CII project team studied basic supply chain management (SCM) elements and current practices in the manufacturing and construction industries. The team will show how SCM is the logical next step in the evolving management of goals and services in the construction industry.

Key differences exist between capital projects delivery and manufacturing production, but applying appropriate SCM principles and practices delivers proven cost reduction and schedule improvement benefits in either environment. Different approaches to capital projects SCM will be examined through case studies. Key concepts and enablers required for successful adoption of capital projects SCM will be reviewed.

Plenary Session Presenter

J. A. Jean – Vice President, Procurement, Jacobs Engineering Group

Jay Jean, based in Houston, Texas, joined Jacobs in 1998 and has more than 25 years of experience. His wide-ranging career in project and operations procurement management and contracts management spans across several industry sectors: petroleum and gas, polymers and chemicals, pharmaceuticals and biotechnology, food and consumer products, and many others. He currently is responsible for directing procurement and materials management activities for Jacobs' domestic and international projects that total in excess of four billion dollars in sales. A member of the CII Improving Construction Supply Chain Management Project Team, Jean earned a bachelor's degree in economics from Harvard University.



Implementation Session Moderator

Mark E. Hodson – Global Sourcing Manager – Engineering, Eli Lilly

Mark Hodson, based in Indianapolis, Indiana, joined the company in 1977 and has progressed through a wide range of engineering, leadership, and management positions. His current assignment in procurement allows him to develop and implement many innovative practices in capital program sourcing. Other assignments have provided him with experience in project engineering, program management, and team leadership. He also has extensive experience in personnel and compensation systems. At CII, he served on the Small Projects Project Team and currently is a member of the Construction Supply Chain Performance Project Team. Hodson holds a bachelor's degree in chemical engineering from Rose-Hulman Institute of Technology in Terre Haute, Indiana, and an MBA from Indiana University.



Implementation Session Participants

Paul Behnke, Manager of Purchasing – U.S. Steel

J. C. Boyers, Corporate Alliance Operations Manager – Butler Manufacturing Company

Buddy Clark, Senior Manager, Supply Management Technology – Kellogg Brown & Root

Frank J. Dombrowsky, Manager, Materials Management – Parsons Energy & Chemicals Group

Clark W. Stuart, Senior Manager, Materials Management – Black & Veatch

Iris D. Tommelein, Professor, Civil & Environmental Engineering Department – University of California, Berkeley

Terry W. Zgabay, Gas Development Advisor – ChevronTexaco Corporation

Capital Projects Supply Chain Management

Improving Construction Supply Chain Performance Project Team

Supply chain management (SCM) is recognized as a leading process improvement, cost-saving, and revenue-enhancing business strategy practiced in today's business world. SCM can be defined as the practice of a group of companies working collaboratively in a chain or network of interrelated processes designed to best satisfy end-customer needs while rewarding all members of the chain. SCM applies to all businesses involved in the delivery of capital facilities.

SCM requires a corporate initiative, supported by strategic and tactical planning, to instill systems thinking and promote a new discipline that companies must master. SCM requires a good understanding of production management, planning and design, materials management and business incentives. Like other disciplines within an organization, such as structural, mechanical, or electrical engineering, accounting, and materials management, SCM must have a champion who can drive the ideas across disciplines within the organization as well as across organizational boundaries.

SCM may be practiced on a single project, but the greatest benefits are achieved when it is practiced at the enterprise level, when it involves multiple companies and is applied to multiple projects over an extended period of time. Successful application of SCM to the delivery of capital projects therefore requires a major shift in mindset from all participants.

Supply Chain Management Challenge

A survey of owners, contractors, and suppliers conducted by the Improving Construction Supply Chain Performance Project Team showed that few are aware of the capital projects SCM opportunities and that the implementation of SCM practices varies widely. Many of the CII Best Practices that are fundamental for successful SCM are not used by a majority of CII companies. SCM is seldom practiced effectively across the construction industry.

Managing capital projects supply chains requires adopting a global systems perspective rather than the traditional view of a single stakeholder on a single project. Construction has seen the emergence of long-term alliances between owners and EPC contractors and between contractors and their various subcontractors and material/equipment suppliers, but structuring supply chains must go beyond these one-on-one alliances.

With the application of SCM to the delivery of capital projects, managerial approaches will emphasize:

1. optimizing core competencies with business opportunities
2. mapping, measuring and improving work processes
3. developing long-term and strategic relationships with suppliers
4. planning across multiple projects
5. assembly of unique facilities from standardized work processes, modules, and components

6. extensive use of communication and information technology for information sharing and supply chain collaboration
7. short and reliable cycle times from raw materials to site (and/or strategic placement of inventory in critical material supply chains)
8. phased delivery of materials to the construction site to match installation rates
9. information visibility that allows efficiencies such as risk pooling, logistics optimization, and supplier managed inventories.

SCM is the logical next step in the evolving management of goals and services in the construction industry.

Methodology

PT 172 studied SCM principles and current practices in the manufacturing and construction industries. Although key differences exist between capital projects delivery and manufacturing production, the team concluded that applying appropriate SCM principles and practices delivers proven cost reduction and schedule improvement benefits in capital projects. To document the range of SCM practices, realized benefits from SCM and potential opportunities in capital projects, the team examined several cases that illustrate the use of different SCM tactics.

PT 172 recognized the importance of building on the previous CII research. The team started with the review of the CII knowledge resources on materials management, supplier relationships, design, and construction. As the team investigated the complexity of applying SCM to capital projects, it concluded that most of the CII knowledge resources are applicable to capital projects SCM. With the insights from manufacturing SCM and from the case studies, PT 172 is completing an Implementation Guide for Capital Projects SCM.

Summary

Significant savings in project cost and time and improvements in reliability can be realized by paying attention to defining supply chain performance criteria, selecting supply chain partners for their capabilities, and then structuring relationships with overall supply chain performance in mind. The CII Best Practices should be integrated to promote effective supply chain practices.

Capital Projects Supply Chain Management

Improving Construction Supply Chain Performance Project Team

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Capital Projects Supply Chain Management

Plenary Slides

Benchmarking — The Value of Best Practices

Benchmarking & Metrics Committee

Learning Objectives

- Learn how the value of best practices is established.
- Review current assessments and what they can mean for your project performance.
- Review the impacts of practices based on more than 1,000 projects in the database.
- Learn how to incorporate benchmarking into your continuous improvement program.

Abstract

CII streamlined its Benchmarking questionnaire and expanded its scope during the past year. This presentation will review the process that was used and the results it will have on best practice assessment.

Use of the CII online Benchmarking System will be featured, and will illustrate member organizations' ability to assess practice use and quantify the value of using CII Best Practices. The most comprehensive assessment to date of the value derived from adapting those practices will be presented.

Implementation Session Moderator

John Tato II – Chief, Program Support Branch, Office of Overseas Buildings Operations, U.S. Department of State

John Tato II, based in Arlington, Virginia, joined the Department of State in 1990. At State, he is responsible for developing and implementing a comprehensive database and reporting system and for providing financial management support for the department's 200-plus projects valued at more than two billion dollars. He also is responsible for the change management system. Tato attended the United States Naval Academy and holds bachelor's and master's degree in architecture from Stanford University.



Implementation Session Panelists

Charles M. Green, Engineering Specialist – Aramco Services Company

Carl Gretzinger, Facilities Project Planner, Project Planning Department – General Motors Corporation

Robert A. Herrington, Quality Manager, Central Region – Jacobs

Robert O. Ogletree, Vice President, Marketing Group – BE&K Engineering Company

Stephen R. Thomas, Associate Director for Benchmarking & Metrics – Construction Industry Institute

Benchmarking — The Value of Best Practices

Benchmarking & Metrics Committee

In early 2002, the CII Benchmarking & Metrics Committee conducted a survey of the CII membership to assess the level and satisfaction with benchmarking programs implemented at the company level. Survey results were presented in detail at the April Board of Advisors meeting at Hilton Head, South Carolina. Results showed that in general companies were implementing benchmarking programs, but were not completely satisfied with these programs. The barriers to benchmarking that were cited included the following:

- Lack of awareness of value
- Time/resource issue
- Need more consistency/standardization for both internal and external systems
- Need to focus on projects of interest to me
- Need for more flexible data system

Since its inception in 1996, the Benchmarking & Metrics Committee has been developing a responsive, relevant benchmarking system that meets the needs of the member companies. The benchmarking database now has over 1,000 projects valued at over \$55 billion in total installed cost.

Each year, the committee has added value to the benchmarking program by adding new performance and practice use metrics. Currently, metrics are collected on the following:

Performance

- Cost
- Schedule
- Safety
- Changes
- Rework
- Construction Productivity

Practice Use

- Pre-Project Planning
- Constructability
- Team Building
- Zero Accidents
- Change Management
- Technology Automation/Integration
- Materials Management
- Quality Management
- Planning for Startup

In 1999, the committee deployed the benchmarking program to the Internet, at its Web site, Project Central, located at <http://cii-benchmarking.org/>. Project data are now collected exclusively online. This provides significant benefits both to users and to the program. As the data are collected through an easy-to-use interface, error-checking algorithms are deployed to gather consistent and accurate data.

Project Progress Key Reports are available immediately upon entering project data. The key reports provide scores on performance and practice use with quartile and chart comparisons to the benchmarking database norms. Links to CII products are provided for the user to download publications for improvement — while the project is in progress.

The Implementation Session

This year's conference implementation session will focus on highlighting the recent Program improvements, including the release of the latest questionnaire, version 7. Version 7 is a complete reworking from previous versions. This version was significantly reduced in length in many sections based on the results of reliability analyses and workshops performed over the last year. The online interface has been improved as well, delivering a more user-friendly and reliable benchmarking system for companies to use.

The session will also present new findings from the analyses that illustrate the value of benchmarking. Practices that contribute to the success of different project types will be presented and the value of using CII practices will be highlighted.

Through this presentation, the Benchmarking Committee will address the barriers to benchmarking and how these barriers can be overcome. Panelists at the session will be available to discuss their experiences.

Sources of Information

Benchmarking and Metrics Summary Report for 2001, BMM2002-3, Construction Industry Institute, 2002

Measuring the Economic Impacts of the Contracting Mechanism on Project Outcomes, BMM2002, Construction Industry Institute, 2002

Safety Report for 2001, BMM2001-1, Construction Industry Institute, 2001

Benchmarking and Metrics Data Report 2001, BMM2001-1, Construction Industry Institute, 2001

<http://cii-benchmarking.org/>, Project Central, CII Benchmarking Web site

Benchmarking — The Value of Best Practices

Benchmarking & Metrics Committee

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Benchmarking — The Value of Best Practices

Implementation Session Slides

The War on Terrorism

Keynote Address: General Richard B. Myers

Abstract

General Myers will present “The War on Terrorism” from his perspective as the principal military advisor to the President of the United States, the Secretary of Defense, and the National Security Council. General Myers became the fifteenth Chairman of the Joint Chiefs of Staff on October 1, 2001, less than a month after the terrorist attacks on September 11. He spent the previous 19 months as the Vice Chairman of the Joint Chiefs and has served in numerous operational command and leadership positions, including the Commander of U.S. Forces Japan, the Commander of the Pacific Air Forces, and the Commander in Chief, North American Aerospace Defense Command and U.S. Space Command. No one is better positioned to give an up-to-date status of the war on terrorism or to help focus the construction industry on the highest priority needs of the country at this critical time in U.S. history.

Keynote Speaker

General Richard B. Myers – Chairman, Joint Chiefs of Staff

General Richard B. Myers joined the Air Force through the ROTC Program. His career includes operational command and leadership positions in a variety of Air Force and Joint assignments. He has more than 4,100 flying hours in the T-33, C-37, C-21, F-4, F-15, and F-16, including 600 combat hours in the F-4. He is a graduate of Kansas State University, and holds an MBA degree from Auburn University. In addition to these degrees and courses at the Army War College and the Air Command and Staff College, General Myers attended the Program for Senior Executives in National and International Security at the John F. Kennedy School of Government, Harvard University.



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Exploring Mutual Interests in Construction Safety and Health

Featured Speaker: Dr. Kathleen M. Rest

Abstract

Construction workers suffer over 1,000 fatal occupational injuries annually, which is higher than any other occupation. They also suffer the highest nonfatal occupational injury rate. The National Institute for Occupational Safety and Health (NIOSH) implemented a construction program several years ago to reduce work-related fatalities, injuries, and illnesses in this industry. Dr. Rest will discuss accomplishments in construction by NIOSH, translating research into practice, opportunities for partnerships, and steps to further improve safety and health in the construction industry.

Featured Speaker

Dr. Kathleen M. Rest – Deputy Director for Programs, National Institute for Occupational Safety and Health (NIOSH)

Dr. Kathleen Rest joined NIOSH in 1999 and became its first Deputy Director for Programs. She is recognized for developing innovative programs for the education of occupational and environmental health professionals. She is the author of numerous publications in occupational safety and health, with an emphasis on policy approaches to the prevention of work-related illness and injury, the delivery of occupational health services, workers' compensation, and international occupational health. She previously served on the faculties of the University of Arizona Health Sciences Center, the Medical College of Pennsylvania, and most recently the University of Massachusetts Medical School. Dr. Rest received her MPA from the University of Arizona and her Ph.D. in Health Policy from Boston University.



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Exploring Mutual Interests in Construction Safety and Health

Plenary Slides

e-Commerce — e-Lessons for All

e-Commerce Applications for Construction Project Team

Learning Objectives

- Learn what owners and constructors who adopted e-commerce early on have learned about opportunities and risks.
- Learn which methods are rising above the many options and appear to be better than all others.
- See what changes in processes and relationships successful adopters had to undergo.
- Learn about areas of e-commerce that have proven to be fruitless or less applicable for CII members.

Abstract

This CII project team utilized several surveys and conducted in-depth interviews with major firms to create a guide for successful e-commerce strategies. The team will show trends that are beginning to solidify in this rather immature sector of technology and outline options that CII members should consider when planning or implementing e-commerce.

The implementation session will identify key trends, both positive and negative, regarding the application of e-commerce to engineering, construction, and owner-supported efforts. Even though successes with e-commerce are not yet indicative of a best practice, the team will share approaches that several major firms have found successful and repeatable.

Plenary Session Presenter

John G. Voeller – Senior Vice President and Chief Technology Officer, Black & Veatch

John Voeller has responsibility for directing the vision for the company's strategic technologies and for creating five- and ten-year automation strategies. He is the principal architect of POWRTRAK, the automated engineering system that moved the company to first in both in the U.S. and the world in fossil power plant design and delivery. Voeller was honored by *ENR* with its 1998 Award of Excellence, which recognizes the most significant individual achievement in the construction industry. He chairs the CII e-Commerce Project Team. Voeller is a Registered Professional Engineer in Kansas and Michigan, and holds a bachelor's degree in mechanical engineering from the Georgia Institute of Technology.



Implementation Session Moderator

Winfried Ender – Director of E-Business, Hilti Corporation

Winfried Ender is currently based in Tulsa, Oklahoma, and is responsible for the development and implementation of value-added e-services for Hilti's U.S. and Canada Web sites, including business-to-business e-procurement applications and Web-based employee communication platforms. Prior to his North American assignment, Ender held various positions in marketing and communications at the Hilti worldwide headquarters offices in Liechtenstein. Now a 10-year veteran in the construction industry, Ender previously held management and marketing positions in the banking and food industries.



Implementation Session Participants

D. Dolores Englett, Project Procurement Manager – Shell Global Solutions

Joseph L. Hilgar, Procurement Manager – Air Products and Chemicals

William M. McCauley, Manager, Business Services – Shell Oil Company

Jeffrey S. Russell, Professor, Civil & Environmental Engineering – University of Wisconsin-Madison

Raj Veeramani, Professor, Industrial & Mechanical Engineering – University of Wisconsin-Madison

John G. Voeller, Senior Partner – Black & Veatch

e-Commerce — e-Lessons for All

e-Commerce Applications for Construction Project Team

The CII member industries have seen the rise and fall of the dot-com explosion and are interested in the lessons that can be learned from this episode in technology history. CII tasked its e-Commerce Applications for Construction Project Team to research the use of e-commerce in construction and identify proven and promising approaches that members could consider.

Objectives of the Project Team

- Identify the state of the art in e-commerce applications in construction. (We confirmed that with the immaturity of the technology, it is too early to declare anything a best practice.)
- Study e-commerce best practices and business models from related industries and find opportunities.
- Identify barriers and challenges to e-commerce.
- Make recommendations on how companies can apply e-commerce successfully to become competitive.

The field of e-commerce is large and encompasses hundreds of processes that could have e-commerce added to them or changed by them. The project team analyzed the broad range of these processes and two areas rose quickly to the top of the list: electronic collaboration and procurement.

The project team found that e-collaboration has matured quickly and has become a near *de facto* capability for most of the major players in the industry. What these firms define as e-collaboration and the tools and processes they use are still rather varied with serious limits on integration, security, and legal standing. A critical concern is no longer functionality but rather the financial strength of service providers to whom firms deed some portion of their exposure on cost, schedule, and intellectual property control. Independent of these issues, the team confirmed that anyone not using this collection of techniques will be behind those that do.

The second area found to be key by the project team was e-commerce involving the various methods of procurement. This became the main focus of the project based on the knowledge of the team members and confirmed by the survey data and findings by the academics. E-procurement can be very simple with low risk and reward or very complex with very large reward and increased risk. Our survey, interviews and case studies show that many firms have explored the spectrum of what could be done in e-procurement, but have settled on a few of the simpler processes and a small set of common tools and systems with known risks and relationship changes. Many of the higher level actions of e-procurement will require changes in laws, taxation, intellectual property control, security and identity management, and other areas that lag behind the technology of e-procurement. The team concluded that there was sufficient value in the lower level functions of e-procurement that there is a place for e-procurement of some kind in every business in our industry.

One deliverable the project team was tasked to provide was identification of a best practice in e-commerce. Our results confirm that it is simply too early in all aspects of e-commerce to identify anything as a best practice in the CII definition. Even the largest firms in our industry are still exploring and changing direction as the landscape evolves to match participant and stakeholder expectations.

E-commerce in construction is constantly evolving and adjusting as participants learn, make mistakes, and instruct dependant and supporting partners. This clearly suggests that CII should see e-commerce as evolving and expect to launch teams with a one-year sunset every two years to report on the latest lessons and mutations.

e-Commerce — e-Lessons for All

e-Commerce Applications for Construction Project Team

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e-Commerce — e-Lessons for All

Plenary Slides

FIATECH — Building A Comprehensive Technology Agenda

FIATECH

Learning Objectives

- FIATECH’s progress and organizational status after two years of operation.
- FIATECH’s current projects status
- FIATECH’s Technology Roadmap description and status
- FIATECH’s work to bring FIAPP to member organizations
- FIATECH’s participation opportunities

Abstract

Since its formation in 2000, FIATECH has implemented a number of project initiatives focused on delivering fully integrated and automated project processes (FIAPP) to the capital facilities industry. In this session, FIATECH will present findings from completed research, progress on current projects, and an outline of future initiatives.

The implementation session panelists are all active members in FIATECH projects and will provide more in-depth information on activities and outcomes. Projects that will be reviewed are as follows:

- Capital Facilities Technology Roadmapping
- eBusiness for Capital Facilities
- Mobile Computing for Construction Operations Maintenance
- Life Cycle Data Management
- Smart Chips

Plenary Session Presenter

James B. Porter, Jr. – Vice President of Engineering and Operations, DuPont Engineering

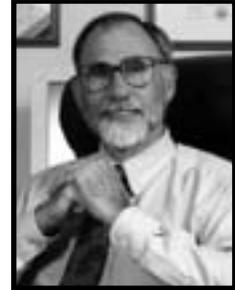
Jim Porter served as CII Chairman in 2000 and has a lengthy association with CII in various executive capacities. Porter’s career with DuPont began in 1966 as a chemical engineer in Newark, Delaware. After a two-year tour of duty with the U.S. Army, he returned to the company and took an assignment as a field engineer. He was promoted to field manager in 1979, followed by an assignment in the Business Methods & Investment Division as Manager of Investment Engineering in 1981. With the restructuring of DuPont Engineering in 1990, Porter became Director of Engineering Operations. In 1992, he was named Director of Operations for the Fluoroproducts business. He has been in his current post since January 1999. Porter holds a degree in chemical engineering from the University of Tennessee.



Implementation Session Moderator

Richard H. F. Jackson – Managing Director, FIATECH

Ric Jackson previously was the Director of the Manufacturing Engineering Laboratory at the National Institute of Standards and Technology. At FIATECH, he has been overseeing the merger with the Owner Operator Forum and launching the first FIATECH projects. A recognized expert in the fields of mathematical modeling, nonlinear optimization automated manufacturing, and technology transfer, Jackson holds a bachelor's degree from Johns Hopkins University, a master's degree from Southern Methodist University, and a doctorate from George Washington University. Jackson will talk about the technology roadmap in more detail and give us an update on the integrated roadmap workshop planned for the Fall.



Implementation Session Participants

Clare Owings, Project Manager – E. I. du Pont de Nemours & Co., Inc.

Mark E. Palmer, Project Manager – National Institute of Standards and Technology

Charles R. Wood, Project Manager – FIATECH

FIATECH — Building A Comprehensive Technology Agenda

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FIATECH — Building A Comprehensive Technology Agenda

Plenary Slides

Onsite Design: When and How Much

Evaluating Onsite Design Project Team

Learning Objectives

- Understand the benefits of onsite design.
- Learn how to use onsite design to significantly improve key project performance measures.
- Learn when onsite design should be employed for optimum results.
- Understand how onsite design strategies should change by project phase.
- Discover the level of effort recommended for onsite design applications.

Abstract

Nearly every project enjoys some level of field design support during construction execution; however, the split between home office and onsite design has varied widely. Research findings presented will include the drivers to an onsite design project execution strategy, project performance measures improved through the use of onsite design, and specific design activities grouped by project phase that improve overall project performance when executed on site. Additionally, the computer-based Onsite Design Tool (OSD Tool) will be introduced that allows the user to query the database by input criteria. The corresponding output recommends individual design activities by project phase and a suggested level of effort for onsite execution to improve the selected project performance measures.

Plenary Session Presenter

David J. Bowlin – Senior Vice President, Centex Engineering and Construction Company

David Bowlin manages the Centex Charlotte office in North Carolina. Early in his career, he served in the U.S. Navy Civil Engineering Corps, including a special assignment at Camp David during the Reagan Administration. While with the University of Texas System, he managed a \$300 million program for the M.D. Anderson Cancer Center in Houston. Bowlin, an instructor for CII Continuing Education at Clemson University, is chairman of the CII Evaluating Onsite Design Project Team. He previously served on the Project Delivery Systems Research Team and authored the CII publication, *Pilot Projects — Tools for Implementation*. Bowlin holds a bachelor's in civil engineering from North Carolina State University and a master's in construction engineering and management from Stanford University.



Implementation Session Moderator

Philip A. Carman – Food and Beverage Global Construction Manager, Procter & Gamble Company

Phil Carman has over 23 years with Procter & Gamble. The first eight years were spent in manufacturing management. Since the late 1980s, he has worked in capital management. Before selecting construction management as his career path, Carman took on various assignments within Procter & Gamble, including designer, design manager, startup manager, and project manager. His wide-ranging experience includes major chemicals projects and consumer products projects.



Implementation Session Participants

Alan C. Aikman, Manager, Project Management Group – Anheuser-Busch Companies

W. Edward Back, Assistant Professor, Department of Civil Engineering – Clemson University

David J. Bowlin, Senior Vice President – Centex Engineering and Construction Company

Kevin E. Cook, Vice President, Design/Build – Murphy Company

Alan Kerley, Vice President, Operations – Day and Zimmermann International

Leslie L. Shepherd, Deputy Chief Architect – General Services Administration

Onsite Design: When and How Much

Evaluating Onsite Design Project Team

Executive Summary

The communication interface between design and construction is one of the most critical points of information exchange within a project. When the communication of design information is timely, unambiguous, and easily understood, construction activities are more efficiently performed. As such, improvements to the communication interface between design and construction will benefit all measures of project performance.

Most projects enjoy some level of field design support during construction execution; the split between home office and onsite design, however, has varied widely. While it is generally agreed that the timely and accurate exchange of information between design and construction is critical to success, it is often unclear what criteria should determine the appropriate level of onsite design support for a given project. Additionally, it has been unknown how onsite design specifically impacts project cost, schedule, rework, changes, and other measures of project performance.

The CII Evaluating Onsite Design Project Team sought to answer the following:

- Does onsite design truly yield benefits?
- If so, which performance measures are improved?
- When should onsite design be employed?
- How much onsite design is recommended?
- Does the design executed on site vary by project phase?

A survey instrument was created to capture data on recently completed CII projects. One hundred fifteen industry participants completed the survey. The surveys contain detailed information for projects exceeding \$9 billion in project value. Approximately 45% of the surveys employed onsite design strategies and 55% did not. With respect to project delivery, responses were evenly divided between design/bid/build, engineer, procure, and construct, and design build projects. Projects ranged in complexity, scope, and total installed cost. Projects also ranged from poor to exceptional.

The project team identified 50 distinct, common design activities. Such activities may or may not be performed onsite. For any given project, the decision to perform an activity onsite varied with the project requirements and project execution. The breadth of the database enabled statistical comparison between the two groups (projects with or without onsite design).

The project team identified a list of 34 Basis for Decision choices. These represent the drivers for executing the work in a particular fashion. The research was able to construct a “profile” of typical projects using onsite design and compared that to the “profile” for typical projects not using onsite design.

Projects utilizing onsite design were driven more by Project Type, Technical Complexity, Constructability, Composition of Design Team, and Communication Interface/Use of Electronic Media than those projects not implementing onsite design. To identify the benefits that actually accrue from performing design activities onsite, previous CII research was referenced to generate a comprehensive list of 29 project performance measures. These are broadly categorized as being related to safety, quality, schedule, and cost. The research indicates that the effective use of an onsite design strategy improved 17 of the 29 project performance measures. The performance measures improved include the following:

Timely issue of design documents and equipment lists	Constructability
Design as a percentage of total installed project cost (TIPC)	Ease of start-up
Safety standards incorporated into design	Value engineering savings
Accuracy of as-built drawings	Usability of design documents
Accuracy of design documents	Effectiveness of communication
Productivity or earned-value during the project	Time to process change orders
Operability, maintainability, reliability, availability	Number of requests for information
Customer feedback/improved partnering relationship	Plant output vs. design intent
Participation in design by construction/manufacturing personnel	

Deliverables

The deliverables for this research project include:

- A method of quantifying the project benefits resulting from the onsite deployment of design activities.
- An identification of the onsite design activities having the greatest impact (per project phase).
- A methodology to identify the key design activities that should be performed onsite to improve selected project performance measures.
- A decision support tool to help determine the optimum level of onsite design deployment for varied project requirements.

This research should benefit owner and contractor companies alike. It has been conclusively demonstrated that onsite design strategies benefit project performance. This research is statistically validated and provides useful guidance to teams developing execution strategies for project design.

Onsite Design: When and How Much

Evaluating Onsite Design Project Team

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Onsite Design: When and How Much

Plenary Slides

One Owner's Project Planning Process Journey

Case Study: General Motors

Learning Objectives

- Understand how the GM Worldwide Facilities Group (WFG) transformed from an internal A/E to a staff “owner representative” role, which required the development of new processes and tools to facilitate project planning.
- See how WFG’s success is linked directly to its involvement in CII and to the implementation of CII Best Practices.
- Learn about the specific e-tools currently used for planning a large annual construction volume.
- Realize that GM’s commitment to CII Implementation is an enabler for continuous improvement.

Abstract

The GM Worldwide Facilities Group has built its Project Planning Process on active CII involvement and use of CII products and tools. This presentation will discuss CII’s influence and provide an overview of the group’s current planning process.

The implementation session will highlight the processes, tools, and software being used to implement the planning process, including those developed by CII. The session also will provide other companies with a repeatable implementation success plan.

Plenary Session Presenter

Gary T. Steinmetz – Manager, Project Planning, Worldwide Facilities Group, General Motors Corporation

Gary T. Steinmetz has 28 years of experience in the construction industry, both as a facilities owner and in the architectural/engineering field. The group that he manages at General Motors is responsible for the front-end planning of approximately two billion dollars in construction annually. A Registered Professional Engineer in the State of Michigan, Steinmetz holds a bachelor’s degree in mechanical engineering from Michigan State University and a Masters of Arts in Management Sciences from Central Michigan University.



Implementation Session Moderator

Robert J. Beaker – Manager of Powertrain and Non-Manufacturing and Project Management Processes, Worldwide Facilities Group, General Motors Corporation

Robert J. Beaker has over 33 years of experience in the construction industry as an electrical engineer, an engineering manager, and as a manager of project managers. Beaker's current projects for GM include new engine plants, warehouses, office programs, and various infrastructure projects. He is the CII Implementation Champion for the GM Worldwide Facilities Group. Beaker holds a bachelor's degree in electronics engineering from Western Michigan University and is a Registered Professional Engineer in the State of Michigan.



Implementation Session Participants

John G. Gentile, Manager, Project Management – International Projects and Metal Fabricating Division – General Motors Corporation

William C. Thorsen, Staff Project Planner – General Motors Corporation

One Owner's Project Planning Process Journey

Case Study: General Motors

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One Owner's Project Planning Process Journey

Plenary Slides

Industry Panel

Shift in Engineering Responsibility from Owners to Contractors — Has the Pendulum Swung Too Far?

The CII Strategic Plan identifies the shift in engineering responsibility from owners to contractors as a major trend within the industry. This shift has surfaced many issues that must be more clearly understood and addressed. Reduced quality of front-end packages is one example, as is assuming that owners have sufficient oversight to catch the majority of production engineering and design errors before they are built. Another consequence of this shift is the increasing difficulty in resolving technical disputes and problems by having contractor engineers and technicians discuss the issues with their counterparts in owner organizations. Are these and other unintended consequences outweighing the factors that initiated the shift in the first place?

During the 1990s, headcount reduction, outsourcing, restructuring, and downsizing were prevalent operating philosophies within owner engineering departments. Contractors often encouraged this by questioning the need for parallel organizations to perform engineering functions that were the “bread and butter” strengths of the contractors, but which were viewed as overhead by owners eager to cut costs to remain competitive. In many cases, this resulted in drastically smaller and less experienced owner project staffs. It also helped to create an image that project engineering/contracting was a “commodity” that could be purchased as a low-dollar item.

The overall result today is a changed environment with many unintended consequences. Projects frequently do not have the owner oversight and final approval of what formerly was a seasoned, experienced cadre of individuals who understood the owner’s operations thoroughly and knew both the strengths and weaknesses of the contractor partners. Also, the engineer/contractor “commodity” often is purchased on a low-dollar bid. It can even be secured online as an auction item, with little or no weight given to “value.” At the same time, the engineering function that now exists in owner organizations does not have the stature internally to be able to significantly influence operational input and adherence to good, basic project practices.

This atrophy of project strengths and experience leads to problems that are almost certain to arise. Without the knowledge and self-confidence that comes with experience, however, most owner and many contractor organizations are reluctant to truly work together to solve the problems. Instead, all will take the safe route, refer to the contract details, and quickly move the dispute to the legal departments. At that moment, the issue takes on a life of its own and the engineers become peripheral players in an escalating conflict between hard-nosed attorneys on both sides. This is another of many unintended consequences of a shift in responsibility that was supposed to make the industry more effective.

Has the pendulum swung too far? The panel members will present their views on this trend that is a critical strategic issue in today’s engineering and construction industry.

Moderator

Theodore C. Kennedy – Chairman, BE&K, Inc.

Ted Kennedy is one of the original members of the CII Board of Advisors. He was selected as the third recipient of CII's highest honor, the Carroll H. Dunn Award of Excellence, is a past Chairman of CII, and chaired the 1988 Annual Conference. He helped found BE&K, a company with projects that can be found across the United States and around the world. BE&K has been recognized many times for safety achievements, including three OSHA Star Awards. *Fortune* ranked it as one of the "100 Best Places to Work For."



Panelists

Thomas R. Hammond – Executive Vice President – Operations, Jacobs

Tom Hammond has been with Jacobs for the past 26 years. He has been assigned to both domestic and international projects and has served in various capacities, including project manager, project engineer, manager of operations, and group vice president. An example project that he has directed for Jacobs is the NASA Space Station Processing Facility, in which Jacobs provided A/E design services. Hammond is a member of the CII Executive Committee.



James B. Porter – Vice President, Engineering & Operations, DuPont Engineering

Jim Porter has a lengthy association with CII in various executive capacities, including Chairman in 2000. Porter's career with DuPont began in 1966 as a chemical engineer in Newark, Delaware. With the restructuring of DuPont Engineering in 1990, Porter became Director of Engineering Operations. In 1992, he was named Director of Operations for the Fluoroproducts business. He has been in his current post since January 1999.



J. Kent Underwood – Senior Consultant, Solutia Inc.

Kent Underwood retired in 2001 as Manager of Capital Project Management after 25 years with Monsanto and Solutia. He served on the CII Board of Advisors from 1986-2001 and on the Executive Committee from 1999-2001. He also served on the Construction Committee of The Business Roundtable from 1986-98 and as its Chairman from 1995-98. Underwood was honored twice with the *Engineering News-Record* Award of Excellence.



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Global Trends and Their Impact on Your Business

Featured Speaker: Janice L. Tuchman

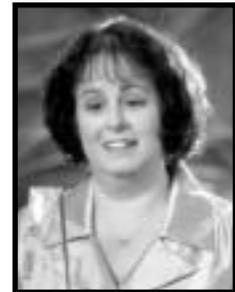
Abstract

Global news events can have a huge impact on the business of construction. *Engineering News-Record* Editor-in-Chief Jan Tuchman discusses the intensified focus on security, construction's role in the war on terrorism and skyrocketing insurance rates among other issues. She also looks at fundamental industry problem spots such as leadership, labor, safety, recruitment, and research, and gives an interpretation of where trends may lead.

Featured Speaker

Janice L. Tuchman – Editor-in-Chief, *Engineering News-Record*

Janice L. Tuchman directs *ENR's* editorial operations and its Web site, enr.com. She works on strategic planning and develops new editorial products, issues, and events. She was the 2001 president of the Construction Writers Association. Tuchman earned bachelor's and master's degrees in journalism from the University of Colorado–Boulder.



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Global Trends and Their Impact on Your Business

Plenary Slides

Benchmarking Productivity Metrics

Benchmarking & Metrics Committee

Learning Objectives

- Learn how to benchmark both construction and engineering productivity.
- Review the metric definitions developed through member company consensus.
- See the results of construction productivity data collected to date.
- Discover how these metrics can be used to improve project performance.

Abstract

Representatives from the CII Benchmarking Committee will present definitions of construction and engineering productivity metrics. They also will discuss a suggested process for incorporating these metrics into a continuous improvement program. Results of the construction productivity data analysis will be used to illustrate how benchmarks will be developed.

Implementation Session Moderator

David G. Hile – Operations Manager, Watkins Engineers & Constructors

Dave Hile has over 20 years' experience in heavy industry, including assignments in the refining, pulp and paper, chemical, and power sectors. He has served as field engineer, project controls manager, and director of business development prior to his current assignment in operations. Hile is co-chair of the CII Benchmarking and Metrics Committee and currently is helping to guide a CII study on productivity and performance metrics for construction and engineering. He is a graduate of Indiana State University.



Implementation Session Participants

W. Kent Goddard, Project Manager – Solutia

James G. Slaughter, Jr., President – S&B Engineers and Constructors

Stephen R. Thomas, Associate Director for Benchmarking & Metrics – Construction Industry Institute

Kenneth D. Walsh, Associate Professor – Arizona State University

Paul N. Woldy, Project Manager – ChevronTexaco Corporation

Benchmarking Productivity Metrics

Benchmarking & Metrics Committee

The CII Benchmarking & Metrics Committee Productivity Metrics initiative, which was launched in June 2000, has made significant progress. Construction productivity metrics have been developed and are now in the data collection stage. As data are received, these metrics will be fully integrated into the CII Benchmarking System that offers online data collection as well as online reporting.

A second major thrust of this initiative, Engineering Productivity Metrics, also is proceeding well. Metric definitions have been developed and data collection will begin following the 2002 CII Annual Conference. Following the 80/20 Rule, metrics have initially been developed for those tasks that will capture the majority of the work-hours on the project with the minimal effort. Both engineering and construction metrics are being assessed for:

- Concrete
- Structural Steel
- Piping
- Instrumentation
- Equipment
- Electrical

Construction metrics are also being assessed for Insulation.

The Productivity Metrics Implementation Session has three goals. First, an update on metric development will be provided. Second, proposed use of the metrics will be illustrated. Lastly, alignment of efforts between the Benchmarking & Metrics Committee and CII Project Team 192, Engineering Productivity Metrics, will be discussed. A panel committee and project team members will be available to address questions.

Sources of Information

Benchmarking and Metrics Summary Report for 2001, BMM2002-3, Construction Industry Institute, 2002

<http://cii-benchmarking.org>, Project Central, CII Benchmarking's Web site

Benchmarking Productivity Metrics

Benchmarking & Metrics Committee

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Benchmarking Productivity Metrics

Implementation Session Slides

Carroll H. Dunn Award of Excellence

The Construction Industry Institute established the Carroll H. Dunn Award of Excellence in 1985 to honor an individual for significant achievements in improving the engineering and construction industry. The original recipient was Lt. Gen. Carroll H. Dunn (U.S. Army, Retired), who had a highly decorated military career as well as successful careers in both the public and private sectors of the engineering and construction industry.

General Dunn

Dunn earned a BS in mechanical engineering from the University of Illinois (1938) and a master's in civil engineering from Iowa State University (1947). He is a Registered Professional Engineer in Texas and the District of Columbia, a Fellow in the American Society of Civil Engineers, a member of the Society of Military Engineers, and a member of the National Academy of Engineering.

After serving as a young officer in World War II under the command of Gen. Dwight D. Eisenhower in Europe, where he participated in combat, Dunn's military career took him to a wide variety of engineering assignments with the Corps of Engineers.

While assigned to the Corps, Dunn worked for the Ballistic Missile Construction Office in Los Angeles, where he directed construction for the Titan II missile system. He later directed the Waterways Experiment Station and the Southwestern Division of the Corps, oversaw construction of the Manned Spacecraft Center in Houston, and led numerous improvement projects by the Corps to the Arkansas River. When Dunn was Director of Military Construction in the Office of the Chief of Engineers, his duties included responsibility for the Army Nuclear Power Program. He was Deputy Chief of Engineers from 1969 to 1971, and simultaneously a member (and later chairman) of the NASA Aerospace Safety Advisory Panel. After retiring from the Army in 1973, Dunn joined Consolidated Edison Company of New York.

In 1977, Dunn was selected by The Business Roundtable to lead a monumental study of the construction industry, which at that time was torn by cost overruns, labor strife, and spiraling inflation. The Roundtable, comprised of 200 CEOs of leading U.S. companies, also recruited more than 250 highly regarded industry leaders from over 125 companies to participate in the wide-ranging analysis of what at that time represented the nation's largest industry (since replaced by healthcare). The Roundtable's landmark study, the Construction Industry Cost Effectiveness (CICE) Project, resulted in over 220 recommendations on how the industry could improve itself. Dunn, as project manager of CICE, coordinated the massive undertaking and saw that the recommendations were published in a series of widely read reports that ranged from safety improvement to technology use to job training and jurisdiction. One particular CICE recommendation went to the heart of the matter: establish an institute for construction-related research.



Leadership in Establishing CII

CII was established shortly after publication of the CICE reports, and Dunn was a key participant and an inspiring leader during its formative years. Picking up where he left off with the CICE Project, he once again led hundreds of knowledgeable and highly regarded industry participants in establishing CII. His commanding leadership, devotion to the industry, and genuine concern for the success of CII inspired the representatives of the member organizations to establish an award to honor him at the first CII Annual Conference in 1985. The Dunn Award of Excellence is the highest recognition by the Institute.

Purpose and Criteria of the Dunn Award

The purpose of the award is to recognize an individual who has had singular and notable responsibility for significant advancements in improving the construction industry.

The award is given only when a worthy recipient, who is selected by the Executive Committee of the Board of Advisors, is apparent. Criteria for the selection include the following:

- Significant contributions to the construction industry.
- Demonstration of the highest degree of personal dedication to improving costs, schedule, quality, and/or safety of the capital facilities delivery process.
- A level of knowledge and breadth of experience that distinguish the recipient as an eminent authority.
- A leadership position in the construction industry from which others can be influenced by example and direction.
- A record of accomplishment that brings added distinction to the recipient, the organizations with which he or she has been associated, and to the industry at large.

Recipients of the Dunn Award of Excellence



Carroll H. Dunn (1985) – inspiring leader and project manager of the CICE Project who guided the establishment of CII as a principal national forum for construction research



Charles D. Brown (1987) – early application of cost-effectiveness principles led to stellar engineering career; DuPont representative to CICE study; energetic advocate of CICE findings



Ted C. Kennedy (1988) – a founder of BE&K; influential member of original CII Board of Advisors; recognized industry leader in education, training, and employee development



Robert H. Miller (1989) – intense DuPont participant during CICE who later chaired CII, oversaw its first published research, and helped to establish its educational program



Louis Garbrecht, Jr. (1990) – pioneered “engineering” of the construction process and proved that constructability is cost-effective; early advocate of project management research; original chairman of CII upon its establishment in 1983



Clarkson H. Oglesby (1991) – research pioneer and author of classic construction engineering textbooks who established the first graduate studies in construction at Stanford University



James M. Braus (1992) – Shell Oil and CICE leader and diplomat who bridged diverse opinions within CII to keep the Institute unified and authored the original CII Strategic Plan



Gary D. Jones (1993) – hard-working, determined 1987 CII chairman whose “implementation challenge” that year led to a dramatic change in how CII viewed implementation



Jack E. Turner (1994) – originated idea that led to establishment of The Business Roundtable, and later suggested a study of owner-contractor issues that became the CICE Project



Daniel J. Bennet (1995) – aspiring association executive, CICE participant, and author of CII by-laws who led establishment of the National Center Construction Education and Research



John W. Morris II (1996) – led effort to unite Corps of Engineers, Federal government, and environmentalists in shaping national water resources policy during turbulent transition era



Richard L. Tucker (1997) – professor, productivity research pioneer, CICE participant, and renowned industry speaker who personally led efforts to establish CII at UT Austin and served as its first Director from 1983-1998



Edward W. Merrow (1998) – researcher who developed the Project Evaluation System, an analytical tool to benchmark project data, and founded Independent Project Analysis (IPA)



Donald J. Gunther (1999) – hard-driving Bechtel executive whose trademarks of leadership, dedication, and teamwork influenced others both personally and professionally as well as changed Bechtel's approach to worldwide business



Arthur J. Fox, Jr. (2000) – long-time editor of *Engineering News-Record* who traveled around the world to report on more than four decades of industry progress and who established *ENR's* Engineer of the Year award more than 30 years ago



H. B. Zachry, Jr. (2001) – a born constructor, he led a road contracting firm founded by his father to a worldwide leadership role through personal dedication to the welfare of his employees and the principles of quality, safety, and client satisfaction.

Dunn Award Recipient

Joseph J. Jacobs

Joseph J. Jacobs was born in Brooklyn, NY, in 1915. He received his BS in Chemical Engineering from Polytechnic University, Brooklyn, in 1937. His master's ('39) and doctorate ('42) degrees in Chemical Engineering also were earned at Polytechnic University.

In 1947, he founded Jacobs Engineering and began operating as both an engineering consultant and a manufacturers' representative for process equipment. During the ensuing 50-plus years, he led Jacobs Engineering to the top echelons of the engineering world. His company has been listed in *Fortune's* Top 500 Companies, is ranked third largest design-build firm by *ENR*, and is also ranked as one of the top Most Admired Companies by *Fortune*. He was Chairman and CEO of Jacobs until 1992, and today serves as Chairman of the Board.



Dr. Jacobs first design-construct project was awarded in 1960. In 1963, this client received the prestigious Kirkpatrick Merit Award from the American Institute of Chemical Engineers for a project that involved Jacobs' help in the development of a potassium nitrate process technology.

During the 1970s, important milestones for Dr. Jacobs and his ever-growing firm were the acquisition of the PACE Companies, establishing a presence on the U.S. Gulf Coast, and opening an office in Dublin, Ireland. In 1971, Jacobs Engineering was listed as a publicly traded company.

The 1990s saw another era of unprecedented growth for Jacobs Engineering. In 1991, the firm passed \$1 billion in annual revenue. Offices were established in Europe, Asia, and Latin America. In 1996, the company was listed in *Fortune's* top 1000 companies, as well as being listed by *ENR* as the largest construction design-build firm in the world. Numerous safety awards were received from The Business Roundtable and clients.

Today, Jacobs Engineering is a Fortune 500 company, with over 30,000 employees and operations on six continents. With revenues in excess of \$4 billion it annually ranks at the top of several *ENR* categories. Its employees occupy leadership roles in many industry forums, including the Construction Industry Institute.

Throughout this period of growth, the bedrock of Dr. Jacobs' ethical beliefs and entrepreneurial spirit has provided an inspiration to the employees of Jacobs Engineering. Dr. Jacobs has given generously to colleges, hospitals, and to his alma mater. He is a recipient of the World Citizen Award (1996) from the United Nations. In 1983, he was awarded the Hoover Medal from President Reagan for contributions to society by an engineer. It is with great pride and sincere appreciation that CII selects Dr. Joseph J. Jacobs to receive its highest honor, the Carroll H. Dunn Award of Excellence.

Outstanding CII Researcher for 2002

Dr. Carl Haas

Dr. Carl Haas has been selected as the recipient of the Outstanding CII Researcher for 2002. According to the panel of judges, he exceeds all criteria and adds honor and distinction to this prestigious award.

Haas is the Liedtke Centennial Fellow and an associate professor of civil engineering at The University of Texas at Austin. He first became involved in CII research in 1994. That initial project resulted in CII's Design for Safety software and publications. A second CII funded project was begun in 1996 with a study of multi-skilling of craft capabilities. Since 2000, Haas has been the principal investigator for a CII study on prefabrication, preassembly, modularization, and offsite assembly (PPMOF). Now nearing completion, this funded effort will soon be released with software and an instruction guide that provides a planning tool to help in decisions involving these techniques. Haas played a valuable role in the team's efforts and as the leading academic, was key to developing the tool that will help in early evaluations of projects that are considering PPMOF.



Haas teaches courses at UT Austin in Construction Automation, Sensing in Civil Engineering, Heavy Construction, Engineering Economics, Scheduling, and Project Management. Haas' most recent research is in the areas of rapid local area sensing and modeling for construction automation, 3D scanning, and analysis of aggregates, tele-operated robots for hazardous environments, critical construction operations planning, automated infrastructure maintenance, trenchless technologies, remote highway condition and incident detection, and construction work force issues.

A Registered Professional Engineer in Texas, he has published over 100 articles, papers, and reports and has been involved in a variety of research efforts. He serves on the CII Breakthrough Committee and also directs the UT Austin Construction Automation Laboratory. In 2001, he received the University of Texas Outstanding Graduate Teaching Award. Haas earned a bachelor's degree in systems design engineering from the University of Waterloo, Waterloo, Ontario, Canada, and master's and doctoral degrees in civil engineering from Carnegie Mellon University, Pittsburgh, Pennsylvania. CII takes great pride in selecting Dr. Carl Haas as the Outstanding CII Researcher for 2002.

Award Criteria

- The research significantly contributed to the improvement of the construction industry.
- The research is completed and products delivered.
- The researcher's excellence is recognized by his or her CII team members, the staff, and the membership.
- The researcher's report to CII is innovative, well written, and timely.

Previous Recipients of the Outstanding CII Researcher of the Year Award

1995 – Mike Vorster, Virginia Polytechnic University

1996 – Edd Gibson, The University of Texas at Austin

1997 – Stu Anderson, Texas A&M University

1998 – Gary Oberlender, Oklahoma State University

1999 – Ed Back, Texas A&M University

2000 – Jeff Russell, University of Wisconsin-Madison

2001 – Ed Jaselskis, Iowa State University

Outstanding CII Researcher Award Panel of Judges

Peter H. Bopp	Regional Engineering Manager, Mexico, E. I. duPont de Nemours & Co., Inc. (Chair)
William W. Badger	Director, Del E. Webb School of Construction, Arizona State University
Richard H. Menke	Manager, Global Facilities Delivery, Eli Lilly & Company
William L. Johnsmeyer	President, Butler Construction, Butler Manufacturing Company
Louis L. Prudhomme	Associate Director for Research, Construction Industry Institute

Outstanding Continuing Education Short Course Instructor for 2002

Edward M. Ruane

Edward M. Ruane has been selected to receive the CII Outstanding Instructor Award for 2002. Ruane is an instructor in the CII Education Short Course Program at Clemson University. In the opinion of the panel of judges, Ruane exceeds all criteria and adds prestige to the Outstanding Instructor Award.

Ruane is Vice President, Procurement/Logistics, for J. A. Jones Construction Company in Charlotte, North Carolina. For the past 10 years, he has presented the Materials Management instruction module at Clemson's Project Management Course Program, administered by the Construction Industry Cooperative Alliance. He also has presented this module at short courses at the University of Texas and Arizona State University.



Ruane currently serves as both an instructor and co-instructor for the updated module at Clemson University and Arizona State University. The Materials Management course module is dynamic in that it contains topics that are subject to current trends in technology. Ruane, through his own personal research and dedication, is able to convey the status of numerous evolving technologies that are an important part of the course.

All of the CII publications used for the development of the original module were prepared under his guidance as a member of the CII Materials Management Task Force and later as Chairman of the CII Electronic Data Management Task Force. He is co-author of the original Materials Management Module and a volunteer reviewer for the current Tools for Effective Materials Management Module.

Students consistently rank Ruane as excellent with respect to both knowledge of subject and ability to communicate. He provides a unique perspective as an executive who has promoted and implemented CII materials management concepts within his company. These concepts include integrated computer systems, bar coding, project Web sites, evaluated receipt settlement, procurement cards, and effectiveness metrics.

It is with great pride and sincere appreciation that the Construction Industry Institute recognizes Ed Ruane as the CII Outstanding Instructor for 2002.

Award Criteria

- The individual is an effective instructor whose contributions, talent, and efforts have been recognized by the participants in the CESC courses. This includes the ability to present the information in interesting and innovative ways.
- Individuals receiving the award shall have earned it for contributions to CESC modules on two or more occasions.
- The individual has not previously received this award.

Previous Recipients of the Outstanding CESC Instructor Award

1995 – Jorge Vanegas, Georgia Tech

1996 – Stan Nethery, Dow Chemical

1997 – Steve Sanders, Clemson University

1998 – Edd Gibson, The University of Texas at Austin

1999 – Don Shaw, Ontario Hydro

2000 – Gary Aller, Arizona State University

2001 – Dr. W. Edward Back, Clemson University

Outstanding CESC Instructor Award Panel of Judges

William W. Badger	Director, Del E. Webb School of Construction, Arizona State University
Chris W. Hyvonen	Senior Vice President, Kiewit Industrial Company
Robert H. Ryan	Associate Director for Education and Implementation, Construction Industry Institute
D. Kent Stephenson	Head, Mid-Atlantic Operations, Naval Facilities Engineering Command, Atlantic Division

Outstanding CII Implementer for 2002

Mohammad S. Al-Subhi

Mohammad S. Al-Subhi is the second recipient of the Outstanding Implementer Award from the Construction Industry Institute. The award recognizes outstanding achievement in enhancing the implementation of CII best practices within one or more CII member companies. In the opinion of the panel of judges for this award, Al-Subhi has met and surpassed all criteria and brings added distinction to the award.

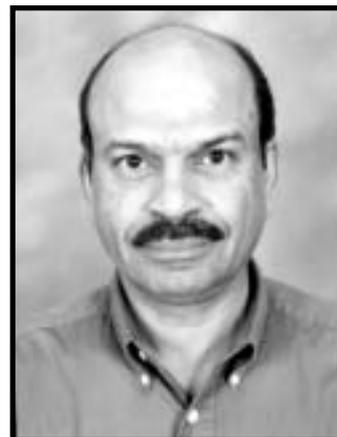
Al-Subhi is Department Manager, Project Support & Controls, for Saudi Aramco and also is the company's CII Implementation Champion. He established a formal program for the implementation of CII products including best practices. Since April 2001, 65 Saudi Aramco projects valued at more than \$4 billion have implemented or are in the process of implementing CII best practices, products, and tools. An additional 45 projects valued at almost \$2 billion will be initiated this year and will also implement an array of CII products.

Early in 2000, Saudi Aramco learned through efforts by CII Benchmarking that its project delivery was behind industry in a number of key performance metrics. As a result, the company set aggressive objectives for improved project performance over a five-year business plan starting in 2001. The objectives included reducing project durations by 25 percent and project costs by 15 percent. Al-Subhi was charged with establishing a formal implementation program.

Using the CII Implementation Model as a guide, he compiled a range of CII products and tools to be implemented, including: Alignment; Project Definition and Rating Index (PDRI); Scope Control; Change Management; Schedule Optimization; Constructability; Planning for Start-Up; and Lessons Learned. In addition, he identified other activities to improve communications and knowledge management.

Al-Subhi was instrumental in obtaining experienced and qualified personnel for the implementation team. In April 2001, a Best Practices Team began hands-on implementation with company project teams. The first step was to provide a short and informal training session explaining the CII Best Practices, products, and tools being implemented on Saudi Aramco projects. These were used to supplement formal training through an in-house course. The Best Practices Team worked with each project to assist with and facilitate the implementation of the chosen best practices for each project.

Due in large measure to the dedicated implementation efforts of Al-Subhi, Saudi Aramco has embraced the use of CII products to improve project performance. The implementation plan has been extremely successful and is taking root in project execution, and the company is on track to achieve its project performance improvement objectives. The Construction Industry Institute is proud to honor Mohammad S. Al-Subhi with its Outstanding CII Implementer Award for 2002.



Award Criteria

- The nominee has made a significant contribution to enhancing the implementation of CII Best Practices and/or CII Proposed Best Practices within one or more member organizations.
- Objective and specific data are available from the nominating organization that demonstrate the improvements attained through the enhanced implementation of CII Best Practices or CII Proposed Best Practices. The categories of improvements should include: cost, schedule, safety, quality and process improvement.
- The nominee has demonstrated a commitment to the implementation of CII Best Practices or Proposed Best Practices.
- The nominee has developed and/or employed creative and innovative means to enhance the implementation of CII Best Practices or CII Proposed Best Practices. The nominee has also willingly informed others of these means and has shared the details of their use with those interested in implementation.

Previous Recipient of the Outstanding Implementer Award

2001 – Dick Jessop, Ontario Power Generation

Outstanding Implementer Award Panel of Judges

Virgil L. Barton	Manager of Quality Services, Bechtel Inc.
Richard F. Kibben	President, Kibben Consulting
Robert H. Ryan	Associate Director for Education and Implementation, Construction Industry Institute
James G. Slaughter	President, S&B Engineers and Constructors Ltd.
Jack E. Turner	Consultant, Construction Management Services

Benchmarking User Awards for 2002

The Benchmarking User Awards are awarded annually to companies that show exceptional use of and contributions to benchmarking. This year, the award was given to one owner and two contractors. The following paragraphs describe the recipients.

Owner: Aramco Services Company

Aramco Services Company was chosen as this year's owner company recipient because of its outstanding support of the benchmarking program. Aramco provides strong support to the Benchmarking Committee and has hosted numerous development meetings and a training session at its offices in Houston, Texas. The company also has actively submitted a large amount of ongoing and completed project data to the Benchmarking database.

Contractors: Dillingham Construction Holdings and S&B Engineers and Constructors Ltd.

For 2002, the contractor award for benchmarking was given to two companies: Dillingham Construction Holdings and S&B Engineers and Constructors Ltd. Although unprecedented, honoring two companies in the contractor category was something that the committee felt comfortable in doing since each had contributed so much in various ways during the past year. Both companies aggressively supported the productivity measures initiative in the development stages and submitted productivity metrics project data. S&B hosted many of the development meetings for productivity metrics at its headquarters in Houston, Texas, and has committed the time and service of many of its employees to the validation effort. Dillingham Construction Holdings has provided a leadership role by co-chairing the Benchmarking Committee and at the subcommittee level for productivity metrics. The efforts of these two outstanding companies have been tremendous and the award to both is well deserved.

Award Criteria

- Best application of benchmarking for project system improvement
- Contributions to benchmarking through active participation (forum, training, project submittal, committee)
- Willingness to share ideas

Previous Recipients of the Benchmarking User Award

2001 – Owner: General Motors Corporation

Contractor: BE&K

2000 – Owner: Champion International

Contractor: Jacobs Engineering

Benchmarking User Awards Panel of Judges

The Benchmarking & Metrics Committee selects the recipients of the award each year. The committee includes the following individuals:

Bob Baker	Estimating Manager, Rust Constructors Inc.
Joel R. Barnett	Senior Estimator – OG&C, Fluor Daniel
Robert E. Chapman	Economist, Office of Applied Economics, NIST
Gregory D. Clum	Corporate Manager, Construction Technology, Black & Veatch
James B. Gibson	Vice President, Projects, ALSTOM Power
Charles M. Green	Engineering Specialist, Aramco Services Company
Carl Gretzinger	Facilities Project Planner Project Planning Department, General Motors Corporation
Robert S. Hemstad	Senior Manager of Construction, Jacobs
Robert A. Herrington	Quality Manager, Central Region, Jacobs
David G. Hile	Operations Manager, Dillingham Construction Holdings
Robert E. Houghtaling	Engineering Manager, DuPont
Howard Kass	Program Manager Facilities Engineer, NASA
John E. Kurth	Senior Vice President, Operations, Kvaerner
Grant G. Landry	Manager of Engineering & Projects, CDI Engineering Group
John M. Mellin	Manager, Business Planning & Performance, GlaxoSmithKline
Philip R. Moncrief	Vice President & General Manager, Technip USA Corporation
Bruce W. Nightingale	Project Manager, Materials Management, Praxair
Wladimir Norko	Senior Engineer, Technical Policy Branch, U.S. Army Corps of Engineers
Robert O. Ogletree	Vice President, Marketing Group, BE&K
Richard F. Ott	Project Manager, Cost/Schedule, Anheuser-Busch Companies
Timothy P. Rigsby	Director, Construction Management Services, Johnson Controls
George R. Rosas	Manager Estimating, Celanese Chemicals
Stephen J. Rothwell	Support Services Administrator, European Construction Institute

James G. Slaughter	President, S&B Engineers and Constructors Ltd.
Curt M. Staley	Vice President & Director of Operations, Coelectric Partners
David L. Stickel	Global Project Management Manager, Procter & Gamble
John Tato	Director, Project Evaluation & Analysis Division, U.S. Department of State
Stephen D. Warnock	Director of Operations, Washington Group International
Ivor Williams	Executive Director, European Construction Institute

Securing the Future of America

Banquet Speaker: Congressman J. C. Watts, Jr.

Abstract

The events of September 11, 2001 have forever changed the U.S. We are a strong nation, however, and must continue to work to secure the future for our children and our grandchildren. We must strive to leave this world better than the way we found it.

Presenter

Congressman J. C. Watts, Jr. – U.S. House of Representatives, (R) Oklahoma

J. C. Watts, Jr., represents the fourth district of Oklahoma in the U.S. House of Representatives. He also is the chairman of the House Republican Conference. Watts serves on the Armed Services Committee and is a member of the Military Readiness Subcommittee and the Procurement Subcommittee. Honored many times for community service, he serves on the board of representatives of the Fellowship of Christian Athletes in Oklahoma and has been a leader for the Boy Scouts of America. While at the University of Oklahoma, Watts excelled as the quarterback of the Sooners football team and led them to two consecutive Big Eight Conference Championships and two consecutive Orange Bowl victories, and was voted the Most Valuable Player in both Orange Bowl wins. A member of the Orange Bowl Hall of Fame, he holds a B.A. in journalism from the University of Oklahoma.



Knowledgeable Point of Contact

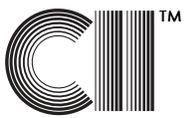
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