UNETHICAL AND ILLEGAL BEHAVIOR

Project Expectations Regarding Ethics
The AACE International 2019 Slate of Candidates
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Why the secret to success is setting the right goals.

Our leaders and institutions are failing us, but it’s not always because they’re bad or unethical, says venture capitalist John Doerr -- often, it’s simply because they’re leading us toward the wrong objectives. In this practical talk, Doerr shows us how we can get back on track with “Objectives and Key Results,” or OKRs -- a goal-setting system that’s been employed by the likes of Google, Intel and Bono to set and execute on audacious goals. Learn more about how setting the right goals can mean the difference between success and failure -- and how we can use OKRs to hold our leaders and ourselves accountable.

Source: www.ted.com
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Project Expectations Regarding Ethics

Technical Board Spotlight
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For additional industry news and updates, you can always visit us at web.aacei.org.
# The Top 10 Reasons To Join AACE International

Ready to advance your career and begin enjoying the advantages that our members enjoy? Whether you are an experienced cost engineer or a student, we have a membership ready for you.

<p>| | |</p>
<table>
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| 1 | **Time**  
Gain access to a wealth of resources that will save you time and money! You’ll stay informed about the complexities of the cost and management profession - plus you’ll have access to discounts on educational programs, publications, and more! |
| 2 | **Information**  
Locate thousands of technical papers and publications in the Virtual Library. AACE’s database is keyword searchable for quickly locating appropriate reference articles. |
| 3 | **Career**  
Members can post resumes at no additional cost in our Career Center and keep your career on track through information sources such as our annual Salary and Demographic Survey of Project and Cost Professionals. |
| 4 | **Learning**  
We offer numerous online learning courses on estimating and project management. The Approved Educational Provider program helps maintain high quality development courses and providers. AACE also holds many seminars throughout the year. |
| 5 | **Resources**  
Starting with the TCM Framework and Recommended Practices that are available for free only to members to our bi-monthly publication Cost Engineering featuring articles for cost professionals around the world. Through the AACE International website, the Cost Engineering journal is a great current resource for members and as a member, you gain access to an archive of past issues. |
| 6 | **Technical Development**  
Increase your knowledge and expertise by joining one of AACE International’s many technical subcommittees, subcommittees, and Special Interest Groups (SIGs) at no additional cost to members. Discuss industry problems with your peers or help experts develop new and improved techniques and practices for the profession. |
| 7 | **Networking**  
By attending a local section or our Annual Conference & Expo for interesting speakers, informational tours, social dinners and much more. The online Membership Directory is an excellent source for a list of contact information on thousands of members. Join one of our many technical subcommittees and participate in the AACE Forums - a great way to tap into the collective wisdom and experience of our world-wide membership. |
| 8 | **Excellence**  
Our certification programs are independently accredited by the Council of Engineering & Scientific Specialty Boards. AACE certifications are a recognized credible standard in the cost management field. A recent study shows that individuals with an AACE Certification earn 17.4% more than their counterpart without a certificate. |
| 9 | **Discounts**  
On products and services ranging from AACE International Conference & Expo registration fees, archived webinars and presentations, certification examination registrations, and more! |
| 10 | **You!**  
We are your professional partner bringing you information and support you can trust. Join and become part of a unique network of individuals who are dedicated to improving the cost and management profession. |

[JOIN TODAY! web.aacei.org](http://web.aacei.org)
Have you ever considered how many entities are involved on a project?

On a construction project, from start to finish, there are many different disciplines and other entities represented. Real estate, planning, architecture, engineering, project management, project controls, facilities, finance, and more are all involved at some stage of the project.

Now, consider how codes of conduct and ethics are treated for each of those disciplines and organizations. The majority of professional institutions require members to agree to a code of ethics. The majority of companies have codes of conduct and expectations regarding behavior. Are these all similar to each other? How do they compare?

Questions like these, and both real and perceived problems with inconsistent approaches, led to the formation of a global coalition in 2014 to study the situation. The first meeting was held at the United Nations. Since then, the International Ethics Standards Coalition (IESC) has mapped and discussed ethics standards and codes of conduct for organizations around the world. The Coalition has over 100 members, including professional bodies, governments, companies, universities, major corporations, and non-governmental organizations. Major corporate supporters include AECOM, Arcadis, CBRE, Colliers International, Currie & Brown, Cushman & Wakefield, Faithful & Gould, Gleeds, Jones Lang LaSalle, Skanska, and more.

In 2017, the IESC issued an over-arching ethics standard to which all land, property, construction, infrastructure and related professional organizations can subscribe. It is intended to transform public perception of our industry and confidence in project investments by creating and implementing an ethical standard to be used by all people (disciplines, organizations, and other entities) working on a project, at every stage of the project and asset lifecycle. It places all project participants on equal footing, regarding conduct expectations. Thus far, it has been translated from English into Bulgarian, Portuguese, Russian, and Spanish.

The ten key concepts of the IESC ethics standard are:

- Accountability
- Confidentiality
- Conflicts of Interest
- Financial Responsibility
- Integrity
- Lawfulness
- Reflection
- Standard of Service
- Transparency
- Trust

AACE International is proud to be a member and trustee of the IESC, since 2017. I encourage you to learn more about the standard at https://ies-coalition.org.

If you would like to contact our current president with questions or comments about The President’s Message please address your e-mail to president@aacei.org. To engage in other discussions, check out AACE International’s online Communities at communities.aacei.org.
Life Cycle Cost Analysis

“I am not rich enough to afford cheap things.” This well-known proverb is a core principle of Life Cycle Cost Analysis (LCCA), which emphasizes that a lower cost of asset acquisition may not always be the best choice over the life cycle of owning and maintaining an asset. This is true whether the asset we are acquiring is a new car, or a new capital facility to manufacture cars; and is a key focus of AACE International’s Total Cost Management philosophy. LCCA is a methodology that supports an effective comparison between competing alternatives where costs (and benefits) may be spread over an extended life cycle.

For the capital project industries, project teams are often focused on minimizing the capital cost of facility planning and construction through start-up of an asset; however, this asset acquisition cost may be a small fraction of the total cost of ownership of the asset that also includes costs to operate, maintain, and eventually dispose of the asset. For example, an oil refinery may operate for 30 to 40 years (or more) with the costs of operation and maintenance over that life cycle exceeding the original capital construction costs by a multiple of ranging from 20 to 100. The cost of procuring or constructing an asset is just the tip of the iceberg in terms of total cost of ownership!

Life cycle cost analysis provides an economic evaluation methodology for assessing the total cost of lifetime ownership of an asset; taking into account all the costs of acquiring, operating, maintaining, and eventual disposal of an asset. In order to provide an effective evaluation of costs over multiple years, LCCA relies on the concept of discounting that provides a method to convert future lump sum values, a uniform series of future values, or an incremental series of future values to a present value. The comparison of present values between potential alternatives provides a consistent methodology to evaluate the life cycle costs for alternatives that may have differing life cycles of asset acquisition and operation. Note that the concept of discounting can also be used to support a future cost evaluation (or an annual cost evaluation) between alternatives; although present value comparison is most common. The discounting conversions can also incorporate the impact of escalation when required.

Discounting conversions are supported by mathematical formulas and tables, as indicated in the Table 1:

<table>
<thead>
<tr>
<th>Common Discount Formulas</th>
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<tbody>
<tr>
<td><strong>Factor</strong></td>
</tr>
<tr>
<td>Single Present Value Factor</td>
</tr>
<tr>
<td>Single Future Value Factor</td>
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<tr>
<td>Uniform Present Value Factor</td>
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<tr>
<td>Uniform Future Value Factor</td>
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<tr>
<td>Uniform Annual Series Factor</td>
</tr>
<tr>
<td>Uniform Gradient Present Value Factor</td>
</tr>
<tr>
<td>Uniform Gradient Present Value Factor</td>
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<tr>
<td>Uniform Present Value Factor with Escalation</td>
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Note that the discount formula notation uses the (X/Y, i, n) scheme, which means find equivalent amount “X”, given amount “Y”, discount rate “i”, and the number of compounding periods “n”. When escalation is also factored into the discounting formula, it is represented by “e”.

Table 2 shows a simple investment alternative comparison evaluation:
The typical steps involved in a life cycle cost analysis are:

1. **Identify and define the problem requiring LCCA**
   This step involves identifying the potential opportunity (e.g., creation of a new asset, modification of an existing asset, retirement of an asset). Identify the potential time periods to be considered in the analysis. Identify the appropriate financial or other criteria upon which to base an eventual decision (e.g., present value versus future value, discount rate to be used in the analysis).

2. **Develop potential alternatives/solutions to consider in the analysis**
   This step determines viable alternatives that will have economic impacts to be considered in the analysis. It may involve the consideration of capital and non-capital solutions. Often, making no change to the status quo is a potential option to be considered.

3. **Develop the cost breakdown to support the analysis**
   The cost breakdown structure for the analysis will vary based on the particular problem under consideration and the alternatives, but at the highest level will typically include identification of acquisition costs (e.g., planning, procurement, construction) and sustaining costs (e.g., operating costs, utility costs, maintenance costs, repair costs, etc.).

4. **Collect data and information to support the required cost and benefit values for each alternative**
   Effective analyses typically require a large amount of information to determine reasonable estimates for all elements of the cost breakdown structure. The analysis must address all elements for both acquisition and sustaining costs for each alternative; with the goal to provided sufficiently reliable unbiased estimates of both costs and benefits for each alternative.

5. **Prepare the cost profiles and LCCA model for each alternative**
   Develop the cost profile (cost/benefit flow) over time for each alternative. Use the cost profiles to develop the LCCA model with appropriate discount formulas to support the financial analysis. The LCCA models should address all significant cost and benefit impacts (sufficiently complex but not overly complex).

6. **Analyze results**
   Analyze the results for reasonableness. Prepare supporting analyses such as Pareto charts of key cost drivers or breakeven analyses. Test significant cost drivers with different assumptions or incorporate uncertainty analysis into the model to evaluate sensitivity for key cost/benefit drivers. Recycle to previous steps to adjust the model if warranted.

7. **Communicate results and determine the course of action**
   Prepare reports to communicate the LCCA results to support decision making.

Life cycle cost analysis is intended to measure cradle to grave costs for the asset or activity under consideration. It can be useful to identify key cost drivers to overall profitability and tradeoffs between competing alternatives. It’s a valuable technique to improve decision making by focusing on Total Cost Management and improving long term cost effectiveness.

The most effective impact from life cycle cost analysis is obtained when it is employed as a value improving practice during the early stages of project planning. It requires identification of alternatives, and good alternatives often require creation ideas. Focus on sufficient complexity to support the decision to be made. LCCA models should be flexible, traceable, and scalable; and the supporting data should be quantifiable and defensible.

The techniques to perform life cycle cost analysis are not difficult; however, they do require attention to detail to meet the objectives of the analysis. When performed well, they support better decision making by focusing on long-term costs and benefits to maximize capital investment performance.

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**Editor’s Note:** This is part of a continuing series of short articles provided by members of the AACE International Technical Board.
Unethical and Illegal Behavior

BY BRUCE E. BRADLEY, CEP
Reprinted from a December 2016 article

It doesn’t matter if you’re from the Greatest Generation, a baby boomer, Generation X, a Millennial or whatever the next descriptive term used will be. It doesn’t matter what your gender is, your political affiliation, your religious identification, your sexual orientation, where you were born, where you went to school, or any other label that distinguishes who you “are.” What should matter to each and every one of us is our behavior – ethical and legal – towards each other and every situation we find ourselves in.

What are ethics? They are the rules or standards governing the conduct of a person or the members of a profession. Some of the most obvious groups that come to mind are doctors, lawyers and financial/accountants. Think for a moment what each of our lives would be like if all three of these groups alone disregarded their ethical guidelines? Total chaos! We rely on doctors to keep us healthy, lawyers to keep us well, whatever lawyers do to help us and financial/accountants to keep us paid and more likely than not, cash positive! Many times, in our own careers we find ourselves in the position where we get directed to “tweak” this or that; to omit or add something that changes a result. Be aware of what you’re doing. If you feel uncomfortable, discuss with someone outside of your project team, most often your supervisor or manager. It never hurts to question anything that makes you uncomfortable!

What is illegal: Anything that is unauthorized or prohibited by a code of official or accepted rules. We have all types of laws to follow – federal, state, county/parish, city, etc. – all focused on what we can and cannot do. Think of Homeowners Associations in our communities – you better keep your grass cut! We have speed limits in our neighborhoods as well as our highways. When (if?) we get caught speeding, we get a ticket (sometimes a warning!) and we must pay a fine. Be aware of your professional responsibilities in the locations where you work.

What is a Code of Conduct: A set of conventional principles and expectations that are considered binding on any person who is a member of a group. These are established by almost every company to make sure their respective employees know what is expected of them within the parameters of each individual
company. It doesn’t matter if the company is in manufacturing, engineering, computer software, retail sales, wholesale sales, education, real estate, agriculture, aviation, etc., they all will establish their own code of conduct. Most of these, within reason, are approximately the same, with uniqueness specific to their own industries. All companies tend to have a dress code of do’s and don’ts, while software companies may tend to be the only ones that allow you to bring your pet to work! Make sure you are aware of what your company expects from you.

**AACE INTERNATIONAL CANONS OF ETHICS**

AACE International Members shall uphold and advance the honor, dignity, and practices of Cost Engineering and Cost Management. The entire Canon follows this article. By the way, “Canons” means “a general rule or standard, as of judgment, morals, etc.,” not what armies use to attack each other with! Click [here](#) to refresh your memory of what you agree to do with any membership or certification application, and upon receipt of gaining your certification credentials.

There’s an old saying that “honesty is the best policy.” It’s a simple phrase but is extremely powerful. Anyone who has ever been caught in a lie – and who hasn’t? – knows the more you lie, the deeper the hole you dig yourself into that you’ll eventually have to climb out of. The most important lesson anyone must learn is to embrace ethical and legal behavior. In your personal life and in your professional life. Let your actions and your words define who you are. Don’t get caught up in “it’s just a little white lie,” “c’mon, no one will ever know,” “it’s a once in a lifetime deal” or any other cliché that has never been disproven or lost its original meaning. Only you can protect your professional reputation. Make wise decisions!

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New Orleans, Louisiana, USA
My experience over the years is indicative that mentoring is very much a dynamic responsibility and a transformative guidance process. The fast adaptation to this rapidly evolving environment requires that both mentors and organizations need to respond to new developments and situations. For organizations, it means tailoring their mentoring programs to their professional and core competencies. For mentors to be a partner in the success of their mentees, it is a value-add for them to embrace the changing scope of mentoring.

As a mentor, the core contributing competencies that I bring to the table include skills and knowledge in project management, cost management, planning and scheduling, earned value, presentations, communication, open-mindedness and active listening. As a project controls consultant/project management educator and a mentor, I have been providing professional services on major projects over the past 30+ years. Learning experiences gathered through my career journey have provided me with relevant practical knowledge that is transferrable to the mentoring partnership journey. These skills and knowledge enhance my capabilities to address a diverse range of challenges that the mentee encounters.

The mentees that I have had the opportunity to mentor range from those that are either in their early stages of pursuing project controls as a career, including new graduates and/or new entrants into the workforce, as well as the seasoned professional who needs to build their personal capacity in a specific area. The skills and knowledge that I contribute to the mentoring program is based on a combination of the career and life experiences and the knowledge gained from my professional associations, such as AACE.

My project controls experience started with my first job that I worked on which was in the oil and gas industry in Alberta; this was followed up with assignments in mining, power and infrastructure projects throughout Canada, U.S., Italy, and Chile in South America. These complex capital intensive heavy industrial projects have ranged in value from $300 million to $4 million. I have provided enterprise planning and scheduling set-up, monitored, controlled and forecasting and specializations in the use of project management software (Primavera P6).

These Industry experiences are advantageous and have application to challenges of a wide range of mentees. I have had the opportunity to work with a variety of mentees from a diverse background including, IT, nuclear, pharmaceutical and finance. Though my background in heavy industrial project is technically different from my mentees. The project management processes and the soft skills learning that I can provide are universal in application.

Being a member of AACE has been advantageous; I became a member in the 80’s and a Certified Cost Consultant (CCC) in 1989. Continuous improvement has taken many forms inclusive of the annual Conferences & Expo in which I have had the privilege to participate as a speaker and an attendee.

I have been a member of the Education Board and am also currently involved with local AACE Section and PMI Boards. As a member with the Education Board I have contributed to the development of PSP (Planning Scheduling Professional) and EV (Earned Value) certifications and in the S&K 5 and S&K 6 development. AACE has provided a venue for me to share my cost engineering educational journey; and in the past 20 years I have presented over 15 papers at AACE annual Conferences & Expos throughout North America. Currently, as the VP of the Toronto Section, I am actively promoting the benefits of being a member with AACE via networking with professionals and doing presentations and seminars. This experience and association provides a learning by example guide to mentees.

My approach to a professional mentoring program is to view it from the perspective of a mini-project. Firstly, by defining the process, I followed up with planning, then to its...
execution phase, with the final session of a learning review of the entire mentoring process.

The important considerations in the defining phase of the process are for the mentor to understand the mentee; understand the responsibility that is being undertaken and develop a checklist. This includes reviewing the mentee’s resume and information that was sent to you so as to identify where the mentee is currently in their professional development and how you as the mentor can support their journey. Know that the relationship that you build with the mentee will determine the success of your mentoring project; success as it relates to both parties. With this in mind, the activities during the mentoring sessions must focus through learning to enhance the development of the mentee. Hence, the willingness to share your skills and knowledge is a must. I found it is about inspiring and supporting the mentee.

The planning phase starts by having an initial meeting with the mentee and setting expectations prior to formally commencing the program; this stage is all about starting to build a relationship – the focus is on the sharing of knowledge between mentee-mentor based on the information provided in the definition phase.

Communicating and sharing our understanding as to the expectations and what mentoring is:

• What is the mentee’s vision and goals?
• Agreement on the mutual sharing of experiences and the achievement that they are proud of and the challenges that provide a learning experience and opinions to create agreed upon outcomes based on sample life history timeline from the definition phase.
• During the mentoring process, no personal issues or correcting the mentee’s performance.
• Define and agree on expectations and set meeting norms. This is achieved by having a signed confidentiality agreement of expectations to be met that is signed by both mentors and mentees.

In the execution phase, providing guidance and opportunities is crucial to the success of the project.

• The framework set in the definition and planning phases guides the execution strategy. Each mentee is unique, and I have found that at each meeting there are new challenges to discuss.
• Sharing both hard and soft skills is a responsibility. One of my mentees only wanted soft skill help as per challenges encountered in the workplace and another was more specific as the focus was on improving of technical understanding.
• Commit to the time agreed; it is the best way to demonstrate professionalism and inspire your mentee.
• Always be respectful and encouraging when giving feedback; give relevant and actionable feedback so that the mentee is able to learn from the experience.
• Share your knowledge generously; include books, articles, journals such as AACE journals which are a great source for information, recommended practices etc.

There are many reasons that everyone should get involved in a mentoring program inclusive of:

• The skill improvement, mentoring is a mutual learning experiences; as the mentor you are presented with the opportunity to review different viewpoints and different program, whilst the mentee can build on their strengths based on your input.
• The importance of establishing personal and career goals not only as a career advancement skill but also as personal development process. This relates to visioning and goal setting and leadership skills.
• Strengthening knowledge and skills for both mentor and mentee in project controls and project management. The application of these skills refreshes the knowledge of project controls
• Development of soft skills such as communications and listening through practical advice by encouraging and supporting.
• Finally, the biggest benefit to the mentees, myself, the professional organizations and the business are the opportunities that are presented on both sides to leverage the skills, cross-generational knowledge and cross-cultural experiences.

Editor’s Note: This is the fourth of a series of Spotlight on Mentoring profiles of AACE members who are currently participating in the AACE International Mentoring program. If reading these profiles inspire you to want to become a mentor, contact the AACE Committee for Mentoring Excellence, by sending an e-mail to: mentoring@aacei.org.

“Know that the relationship that you build with the mentee will determine the success of your mentoring project; success as it relates to both parties.”
— ROHIT (ROY) SINGH
Marina Jewell-Ohran was bit by the construction bug early in life. Her father was a field engineer and during her childhood, she found herself in a new city every couple of years. When she was 9-years-old, she recalls seeing a new housing development go up in her neighborhood. She would wake up early to the sounds of heavy equipment and nail guns combined with the scent of freshly laid asphalt and was hooked.

While working on her business degree from Washington State University, she was hired as an intern with Bechtel and had the first taste of construction and project controls. Upon graduation, she was hired as a full-time project control engineer.

In the first 10 years of her career, Marina was fortunate to travel to and work on several projects. These included decontamination, R&D, and clean construction at Department of Energy sites to commercial telecommunications and re-certifying dams in the Pacific Northwest. Experiencing construction in the public and private sectors in the first few years of her career was invaluable to her future path. It provided her with the knowledge and background to be flexible with both work and team members. Some people believe that schedulers are only good for the field they are in. Marina’s travels taught her that scheduling is more about team communication and her role was to facilitate open conversation. From there, building a schedule is easy.

When moving every couple of years became a bit much, Marina was hired at Boeing and again found herself working for both government and commercial projects. In this environment, she truly flourished. Her background in earned value management made her a subject matter expert and was responsible to train peers and support her projects in varying government auditing. This was also the first employer where she found a mentor. Her mentor was not in project controls, but rather project management. Finding a mentor who was not only a woman, but a true leader was invaluable to her career growth. She taught Marina it was okay to make decisions, but also admit when a decision was not made on the best information. This mentor also showed the importance of patience. It is easy in a busy work environment to forget to take a step back and see situations from other’s perspectives. She also learned that not everyone will like you and what is important is to work ethically and be consistent.

In addition to a positive mentor, AACE has been critical in helping Marina find learning opportunities and career advancement. In 2015, she applied for a job through AACE as a project controls database administrator. The company had been looking for someone with both project controls and cost engineering experience for the public sector. After almost one year of not finding the right applicant, they posted with AACE which opened it up to Marina to apply and get hired. In addition to a career opportunity, she turned to AACE when she was ready to attend the University of Washington. Due to working in a remote location at the time, she planned to pursue a construction management certificate online. The pre-requisites were not available locally, so she was able to find the necessary classes through AACE online course offerings.

In the future, Marina plans to pursue a Planning & Scheduling Professional (PSP) certificate and would like to eventually open her own consulting business that focuses on her project controls and project management experience and training.
Phil Martin was born and grew up in a small fishing port in the north east of Scotland. His father worked in the town’s main employer, the oil and gas industry, and his grandfather’s profession was heavily based around numeric calculations. Phil remembers his grandfather setting him numeric puzzles to work out – it was fun and brought out an interest in numbers. It also taught him the value of using your initiative and never giving up until the problem is solved.

On leaving school Phil moved the short distance to university in Aberdeen to gain a degree in Business Studies. During his degree he had a placement year working for BP. He was placed on a project that was constructing an oil platform and associated facilities in the UK North Sea. Phil knew he wanted to work in this industry and after graduating he worked for another multi-national oil and gas company. At this time he also began studying and obtained a Chartered Management Accountant (CIMA) certification. As well as gaining a level of on the job experience, this certification involved studying for and passing a series of exams. One of the exams in particular proved very challenging. Many people failed the exam, including Phil. Phil noticed many of his peers gave up studying at that point. Phil tried again, and failed, then tried a third time, and passed. Phil then went on to pass the rest of the exams at the first time of asking and gained his certification. At that point Phil was offered a new employment challenge with a fledgling independent oil and gas operator. In a relatively short period this company went from a very small start-up with less than ten people to one of the UK’s top 250 companies, where it was then bought over in a multi-billion pound deal. During this tenure Phil had to swiftly develop new skills to keep pace with the company’s rapid growth. He quickly assumed responsibility for leading a team and worked on a diverse range of financial projects such as takeovers, asset purchases and funding initiatives. The fast-paced expansion meant Phil was undertaking a lot of learning on the job as he approached each new challenge. This led Phil to reach out to the professional resources available via his certification.

Phil then joined Chevron and quickly moved into the Major Capital Projects (MCP) team, supporting two MCPs. Phil’s role saw him work alongside Cost Engineering personnel and he was immediately drawn to the various roles they performed. In the same period, Chevron was embarking on an initiative to build its own in-house Cost Engineering expertise. Phil applied for a Project Controls position on the main MCP he was supporting, a multi-location, multi-billion dollar deep-water oil and gas project. He was successful but knew he had a steep learning curve to conquer.

The internal Cost Engineering initiative was based on AACE TCM framework. Martin Darley, AACE past President, was Manager of the Cost Engineering and Project Services team for the MCP Phil was working on. Martin encouraged Phil to join AACE to help him bridge his Cost Engineering knowledge gap and after reviewing his options he decided to study for a CCP qualification. Phil made good use of the wide variety of resources AACE has to offer. He studied the TCM framework, Skills and Knowledge text and study guides. He also enrolled in online webinars and read relevant Recommended Practices. Phil was regularly encouraged and mentored by Martin as his studying progressed. He also travelled to Houston frequently in his role. On one of his initial trips Martin took Phil along to the AACE Gulf Coast branch monthly meeting. Phil enjoyed the networking experience and informative speakers and has since attended more of these meetings when he is in Houston. After submitting his technical paper and working through the AACE study literature, Phil was ready to sit his CCP exam. Phil passed and gained the CCP certification, a truly proud moment for him!

Since then Phil has pushed on with his Cost Engineering career and feels that his CCP qualification has enhanced the respect afforded to him by his colleagues. He submitted an internal Chevron paper which identified an enhancement in the process of calculating Value of Work Done for MCPs with similar characteristics to the one Phil worked on. This was well received and adopted by the Chevron Cost Engineering Centre of Expertise. Currently Phil is leading an upgrade of his MCPs cost management tool, collaborating and sharing knowledge with other MCPs around the corporation.

Phil continues to draw on AACEs available resources in an effort to build his Cost Engineering knowledge. Phil is also targeting attendance at the AACE annual conference in the near future and he also regularly attends relevant conferences held in the UK, such as the annual Project Controls Expo in London. Phil is passionate about introducing Cost Engineering to the next generation and has been involved in Engineers ‘n’ Our Lives, a programme developed and delivered by Live Wire Productions and sponsored by Chevron. Over 10,000 schoolchildren have taken part in the programme which gives them the opportunity to appreciate the role engineering plays in their lives. The students take part in age-appropriate Science, Technology, Engineering and Mathematics (STEM) challenges with the help of Chevron professionals.

Phil’s advice to others is two-fold: Continually look for opportunities to learn new skills – it’s fun, challenging, rewarding and allows you the best opportunity to further your career. His second piece of advice is not to give up when a setback occurs. You have to be very lucky to go through your career and life without challenges. When they occur, meet them head on and push through them. When you then reach your goal it is even more rewarding if you have had to overcome a setback. 😊
THE AACE® INTERNATIONAL

2019 Slate of Candidates

VOTE
Included here is the slate of candidates for the 2019 election. Guidelines allow candidates to have posted a biography and goals/objectives for their respective offices. Annual AACE International elections are conducted electronically from Feb. 1 through 4 p.m. on March 15.

**ADDING CANDIDATES BY PETITION**
The AACE Bylaws provide the membership the option to petition to add candidates. The Bylaws, Article II, Section 4, reads: “Other nominations for the office of Director, or the office of an Officer of the Association, except for the position of Vice President Technical Board, Vice President Education Board and Vice President Certification Board, may be made by petition signed by at least 20 members in good standing. The petitioners shall be responsible for (a) obtaining in writing the agreement of the nominee to serve if elected, (b) securing the biographical data of the nominee, (c) submitting the petitions, the agreement, and the biographical data to be received by the Vice President-Administration no later than December 15th of each year. Each candidate’s name and biographical data shall be made available to the membership no later than December 31st of each year.”

**CAMPAIGNING IS PROHIBITED**
The Board of Directors recognizes that the professional reputation and experience of candidates for Association office are ample testimony to their qualifications and ability to serve. Further, it is believed that these credentials do not need amplification and that campaigning for office by, or on behalf of, candidates is unnecessary, undesirable, and unprofessional.

After nomination, campaigning is defined as organized oral or written solicitation of votes or support, either by a candidate, or by an individual member or section, on behalf of a candidate. A proven violation of this policy shall be considered as prejudicial to the best interests of the Association and a breach of professional ethics. Such conduct will be subject to disciplinary action as provided for in the Association Bylaws. Further, a proven violation(s) of this policy by an aspirant to office, after due hearing in accord with the Bylaws, shall disqualify said individual from holding Association office.

The AACE International Canons of Ethics also states that, “Members will not campaign, solicit support, or otherwise coerce other cost professionals to support their candidacy or the candidacy of a colleague for elective office in a technical association.”

**TO VOTE, MEMBERS MUST CAST A BALLOT ELECTRONICALLY ON OR BEFORE 4 P.M. EASTERN US TIME ON MARCH 15**
Election of officers and directors will be by use of an electronic ballot. The official election ballot for officers will be posted and available to each member and associate member on February 1, 2019.

Members will link to the voting site from the AACE website homepage. Once at the site, members will use their member ID and password to access the ballot and vote. A six digit ID is required. If your AACE ID number does not include six numbers, just add zeros in front of the ID to make it a six digit ID.

Each voter shall properly signify on the ballot the voter’s choice for the various officers. A security feature of the electronic voting system allows members and associate members to vote only once. A voter can print out a receipt that will include an individual verification number as proof of having voted.

For election of Directors-Region(s), these candidates will be listed as a continuing or additional page for members or associate members in the regions electing candidates during the 2019 election. Each voter shall properly signify on the ballot the voter’s choice for the director.

Any member or associate member with questions or other concerns is asked to contact Headquarters for assistance.

Voting will end as of 4 p.m. eastern US time on March 15, 2019. The electronic system will block any voter from casting a ballot after 4 p.m. on March 15, 2019.

**THE 2019 SLATE OF CANDIDATES**

**AT A GLANCE**

**PRESIDENT-ELECT**
Christopher Caddell, PE CCP DRMP
Mohammed Rafiuddin, CCP PSP

**VP-ADMINISTRATION**
Scott A. (Gator) Galbraith, CFCC
Sandra Mejia-Villegas

**DIRECTOR-REGION 3**
Eric Cannon, PSP
Katrina Washington Knight, CCP

**DIRECTOR-REGION 5**
Jason Audette
Ashley Garza

**DIRECTOR-REGION 6**
Mike Bensussen
Roger Nelson, PE PSP

**DIRECTOR-REGION 8**
Abhijnan Datta, CCP
Sankar Subrahmaniyam, EVP

**DIRECTOR-REGION 10**
Oscar Siles Chavez
Carlos Ortega
GOALS AND OBJECTIVES:
Over my tenure of President-Elect, President, and Past President, I would work with the AACE Board of Directors and the wonderful AACE staff to help the organization grow and adapt to best serve our members as our world and cost engineering continue to evolve. Specifically, I want to focus on the following objectives:

• Advocating for AACE in all regions to expand our membership, looking for new ways to reach cost engineers around the world that would benefit from AACE membership.
• Promoting the value proposition of what AACE provides to its members through its body of knowledge, certifications, career development, and networking.
• Supporting the promotion of corporation partnerships by demonstrating the value a corporation can realize through improved standards and practices, development of staff, connection to other corporate practices, and sourcing for quality staff.
• Improving the AACE brand through application of consistent messaging and practices in all our activities and all areas we serve.
• Supporting the evolution of AACE events and activities to better serve our members in an ever changing world with evolving ways to communicate and work. And,
• Helping identify and mentor the next generation of leaders for AACE to ensure there is committed, vibrant leadership for the years to come.

MOHAMMED RAFIUDDIN,
CCP PSP
Mohammed is an active member of AACE International since 2006 with over 31 years of experience in project management, contracts management, project controls, currently serving as Project Controls Manager for WorleyParsons in Al Khobar Saudi Arabia. Mohammed was the Director Region 7 for the term 2014-16 during which Qatar section, with over 150 members and Saudi Arabia West Coast Section, were formed. He served as President of Arabian Gulf Section for two terms 2011-12 and 2013-14. During his first term as President in 2011-12, he initiated certification training courses in all the regions of the section, which now conduct two cycles of certification courses every year. He was unanimously elected to serve second term in 2013-14. He is now conducting in-house training courses with major companies in Middle East like SABIC and ARAMCO to enable their employees pursue AACE certificates and embrace AACE standards. Mohammed holds a Bachelor Degree in Civil Engineering from Osmania University, India and a Master Degree in Engineering Management from KFUPM, Saudi Arabia. He holds CCP and PSP certifications is a lead instructor teaching for CCP, PSP and Risk Management certifications for AGS. He is a regular speaker on project management, cost management and risk management in various technical seminars and is passionate about knowledge sharing and mentoring. In a career span of nearly thirty years in the Middle East, he has worked on mega programs in Saudi Arabia, Egypt and Kuwait as Project Controls Manager and Project Manager and was well appreciated for managing the projects through the economic boom and subsequent downturn. His people management skills have made him a popular figure in his workplace.

GOALS AND OBJECTIVES:
My leadership experience with AACE International Board of Directors and AACE-AGS has given me the insight that AACE International’s body of knowledge and its certifications are not getting the due recognition. My strategic plans and actions include:

• Collaborate with various corporate giants that are not conscious about Total Cost Management or what AACE International stands for, make them recognize the importance of cost management and establish AACE certifications and technical product as global standards.
• Approach various universities and present AACE International and its certifications to the students so they enter into the professional careers as ambassadors of AACE International, with full knowledge of project and cost management.
• Work with various professional organizations that are contemporaries of AACE International and change the competitive environment to a collaborative and knowledge sharing environment.
• Strive to make the AACE certifications a must for job seekers and get the AACE best practices and technical standards as industry norms.
• Work with the International regions leadership in expanding the membership base of AACE International.
SCOTT A. (GATOR) GALBRAITH, CFCC

2004 - became a member of AACE
2007 - earned CFCC
2009 - co-presented technical session at AACE Annual Meeting
2011 - 2013 - North Florida AACE Board of Directors, Section Director
2017 - co-authored technical paper and co-presented technical session at AACE Annual Meeting
2016 - current - AACE Certification Board member

GOALS AND OBJECTIVES:

• To be a unifying voice between the Board of Directors, AACE leadership, and headquarters staff focused on AACE’s mission, goals, and vision.
• Communicate with AACE leadership and headquarters staff to ensure they have the support they need to achieve AACE’s goals, and if not, then working with them resolve the issue.

SANDRA MEJIA-VILLEGAS, P.ENG.

Born and raised in Medellin, Colombia, Sandra has a bachelor's degree in mechanical engineering. Her parents taught her to have high ethical standards, as well as the importance of education and professional growth. She has been in Calgary, AB, Canada since 2007. Her career started as a mechanical engineer in Colombia. She is a Professional Engineer. She explored project controls and realized this field was her true passion. Sandra’s first position was as a cost control specialist at Devon in the Capital Projects Department. She worked as a cost analyst at ConocoPhillips where she was part of the Oil Sands Capital Projects Department. In 2018, Sandra moved to Vancouver, British Columbia, and she currently works as a cost analyst at Turner Construction and loves her job. She is constantly learning. Turner projects in Vancouver are mostly tenant improvements, as well as commercial building construction. Sandra is working toward a Master’s of Science degree in Project Management at George Washington University, Washington, DC. She values the AACE training, seminars, and webinars. She has been part of the AACE Mentoring Program, is serving as the co-chair for the Women in Project Controls Committee, is a contributing member of the Latin America Task Force, the Raising Professionals Committee, and the Vision 2020 Committee. She feels that the exposure to highly experienced and passionate professionals gives her the courage and support to succeed, as well as enhancing her leadership skills. She received the Outstanding Young Professional award in 2016. Her motto is “find your passion and make it your job; enjoy every day and grow.”

GOALS AND OBJECTIVES:

My main purpose is to put all my energy and enthusiasm into our members’ best interest because AACE exists due to the contribution that is offered to all of you.

• As a leader in this position, my main objective is to work to transform our members’ needs and create strategies in a way that better serve AACE needs and purpose.
• Analyze and challenge different existing strategies to stimulate members to actively participate with initiatives.
• Represent the broad membership of the organization.
• Enhance the organization’s public standing by supporting closely the different committees and providing guidance to make their efforts successful.
• Communicating with AACE leadership (Associate Board chairs, section presidents, etc.) about important decisions affecting AACE membership. Always focusing on what creates the most value for the members.
• Support all the programs, products, education and services that the association has for its members.
• Assist in recruiting, orienting and mentoring new board members and new committee members.
• Partnering and communicating well with staff so expectations and goals are met and on time.
• Focus on strategy for the future of AACE.
ERIC CANNON, PSP
Hello, my name is Eric Cannon. I have held a PSP since 2008 and have also been a member since. I am a member of the Section board of the North Florida Section. I am very active in setting up monthly meetings, participating in quarterly board meetings and going to the annual meetings.

Currently, I am employed with Moss, a family owned construction management entity based out of South Florida with national offices. I have been with this family for the past four years serving as the Director of Scheduling. I lead a team of in house schedulers and outside consultants in managing over a billion dollars of work.

I have been in Construction Management all throughout my 25 years. I started as a scheduling engineer with one other company and have been lucky to have moved up in position as a Scheduler and Scheduling Manager I am fortunate to have learned both from my mentors as well as my peers.

GOALS AND OBJECTIVES:
My goals if elected:
• Promote better communication within the sections of this region.
• Promote the use of technology within each section.
• Revive sections that need help in reorganization.

I look forward in serving as Regional Director.

KATRINA (WASHINGTON) KNIGHT, CCP
Katrina became a member of AACE as a student at Clemson University when she won AACE’s national scholarship and has maintained active membership ever since. Katrina holds both the Bachelor of Science and Master of Engineering degrees in Civil Engineering with a specialty in Construction Management from Clemson University. After graduating from the university she moved to Charlotte, North Carolina, where she became a member of the Catawba Valley Section. While there she served as the President, Past-President, and Scholarship Chairperson. In the Charlotte area she reached out to the local schools to speak to students about careers in engineering and cost management. While President of the Catawba Valley Section changed its meeting format from a restaurant setting to sponsor employers’ office locations with pizza being ordered which minimized costs for members.

Since relocating to the Atlanta, Georgia area and joining the Atlanta Area Section she has served as Section President, Past-President, and Vice-President. She also served as a member of the AACE’s Education Board and Women in Project Controls. She has reached out to and spoken at student section meetings at Kennesaw State University’s Marietta campus, formerly Southern Polytechnic State University. During Katrina’s tenure as Section President, the Atlanta Area Section obtained the level of Platinum, which was her objective when she took office.

Katrina is employed as a Senior Cost Estimator for the Metropolitan Atlanta Rapid Transit Authority (MARTA). Of her membership in AACE, she states that while she is not new to Association, she remains true to her vision, goals, and willingness to serve.

GOALS AND OBJECTIVES:
• Develop and distribute a Region 3 newsletter to keep Sections and members abreast of current happenings in the Association.
• Encourage cooperative connections and communication and networking between the sections in the Region.
• Encourage members in the region to support the other sections’ events/programs/activities.
• Partner with the Board as the liaison between it and the sections.
• Make a smooth transition from the current Region 3 Director so that there are no gaps in service.
• Work closely with the VP Regions to assure that goals and objectives are met.
JASON AUDETTE

Jason has been in the construction industry for over 18 years, which the last 12 have been in the project controls arena. I have experience in a wide variety of industries. Energy generation and transmission, manufacturing and petrochemical have been the main focus of my career. I am currently a Project Controls Manager at Burns and McDonnell. I have been with them for 10 years and in this role for 5 years. My primary focus is helping organizations develop Project Management Offices within. Developing standard practices on scheduling, cost and risk are primary needs of most companies I have worked with. Recently, I have been working internationally with Burns and McDonnell India operations. I am constantly referring to the standard practices and universal definitions AACE International have established.

GOALS AND OBJECTIVES:

One advantage I have had with my career is the ability to visit other AACE Regions. I have attended meetings in New England, Southern California and Kansas City. I have made it a priority to attend these meetings to see what they are doing well and to learn from them. This has given me a prospective few have. The successful Regions have three things in common:

• First, they are seen in the area as active participants in the local professional arena. They host round tables and conferences. They attend industry specific conferences as with booths and information.
• Second, the successful Regions have monthly meetings that add value to those anchor companies. The topics are engaging and pertinent to a broad spectrum of people.
• Third and most importantly, they have anchor organizations. These large groups not only provide memberships but direction on where the District needs to focus. These groups help focus our education to fit their current needs.

We also provide a pool of potential candidates for their cost and schedule needs.

ASHLEY GARZA

Ashley is a Senior Project Controls Analyst for Williams and has over five years of project controls experience. She has worked in the oil and gas sector for over eight years. Ashley has been an active member of AACE since 2013. She was a member of the Houston Gulf Coast Section through 2015, prior to moving to Utah and getting further involved. She held the Utah Section Vice President position for the 2016 term and has served as the Utah Section President since 2017. In addition, Ashley has had the privilege of attending three AACE International Conferences. She is currently developing a paper with her colleague to present at the 2019 AACE International Conference & Expo. As President of the Utah Section, Ashley re-energized the section through acquiring quality technical presenters for the monthly meetings, issuing monthly newsletters and worked with her team to implement a new and more modern section website. As the Utah Section President, she collaborated with the Rocky Mountain Section to hold joint meetings and leverage resources. Ashley has reaped many benefits through her involvement with AACE and is looking to further contribute and grow the organization.

GOALS AND OBJECTIVES:

As Region 5 Director, Ashley intends to proactively engage the sections to help generate continuity and growth in the region by:

• Maintaining and encouraging regular contact with all sections within Region 5.
• Gathering the section leaders quarterly to share ideas, resources and lessons learned.
• Providing new section presidents with the proper tools and guidance to be a successful.
• Continuing to encourage joint section meetings where remote regions can leverage one another’s technical speakers and job opportunities.
• Preserve and grow the annual Region 5 Project Controls Symposium workshop.
Mike Bensussen

Mike is a motivated and driven, rising, young professional, published author, exuberant speaker, education board member and active volunteer with more than 12 years combined construction, project management, earned value, finance and project controls experience throughout a broad cross section of industrial domains. Mike draws from a vast and diverse quiver of tools when it comes to decision-making time on the project. His confidence is derived from education and training and his understanding stems from time spent on Nuclear, Environmental, Oil & Gas, Commercial, Industrial and Higher Education projects. In a previous role as Project Controls Engineer at the University of Washington, Mike was able to explore and harness a passion for education and use creative thinking and strategy to promulgate the project controls discipline. This working experience inspired his recruitment and vigorous involvement as a volunteer Associate member of the AACE Education Board. As chair of the University Relations & Outreach committee, Mike leverages networks, resources, tools and relationships to bring the project controls community of practice to the leading edge of both education and industry. He will often appear as a guest speaker within the community – most enjoyably at his beloved alma mater, Washington State University – where he relishes the privilege to mold young minds and perhaps even inspire them to join the project control ranks. Currently, Mike provides his services and expertise in a role allows him to expand his leadership, innovation and collaboration skillsets as Project Controls Manager for RKMI. When Mike is not championing deliverables, he prefers to spend his time with family and friends, in the downhill park on his mountain bike, or at the hockey rink.

GOALS AND OBJECTIVES:

• Expand university relations and outreach to connect with more students and faculty at project controls related educational programs within institutions of higher learning throughout the region. This can be achieved through enthusiastic execution of campus and classroom visits, or student and faculty specific programs aimed at their particular interests.
• Increase AACE student member enrollment and involvement through exciting networking events and educational mentoring opportunities.
• Appeal to more Rising Professionals through enriching and attractive professional social, networking, educational and development offerings throughout the region.
• Increase AACE awareness amongst regional corporations in an effort to encourage company sponsorship of volunteer and mentor engagement.
• Pursue incorporation of AACE Educational Practice 01E-14 – Model Master’s Degree in Cost Engineering – into project management and project controls related curricula amongst regional institutions of higher learning.
• Attend and participate actively in as many regional AACE events as reasonably possible during term of service.

Roger Nelson, PE PSP

Roger Nelson, PE PSP, is an Associate Director within Ankura’s Global Construction practice and has over 13 years of experience in the construction industry in commercial building, heavy civil, and gas and electrical transmission. He received his master’s degree in Construction Management from the University of Colorado, Boulder, and his bachelor’s degree in Civil Engineering from the University of California, Berkeley. He has a wide range of project management and project controls experience including subcontract development, procurement, scheduling, quality and safety, permitting, and change order development/ negotiation, and project closeout. Roger’s construction dispute experience encompasses the commercial, industrial, and civil sectors with clients across the spectrum of government/municipalities, owner/developers, designers, and contractors. Throughout his career he has relied on the superior technical library of AACE which drives his commitment to give back and further the growth of the organization. Roger has been active in AACE for approximately 10 years starting in the Seattle Section and then San Francisco Section upon relocating to the Bay Area. He has served as Vice President and President of the San Francisco Section and has been involved for a number of years with the planning of the Western Winter Workshop. Starting in July of 2018 he was appointed interim Region 6 Director to serve the remainder of the previous term. Roger has been active in contributing to the advancement of the Forensic Claims & Disputes Analysis field through the development and presentation of technical papers at the AACE Annual Conference/Meeting, as well as that Western Winter Workshop. Further, he is a member of the Claims and Disputes Resolution Technical Subcommittee.

GOALS AND OBJECTIVES:

I see the success of the Sections as vital to the growth and overall success of the AACE organization. As Director of Region 6, I will work to support the Sections through:

• Being responsive and accessible to all members in Region 6.
• Sharing lessons-learned between the Sections, particularly as it relates to the recruitment and retention of junior level professionals. Rising professionals are the future of AACE and we need to provide value to individuals who might not have access to the Annual Conferences.
• Supporting the Sections with the development of combined meetings with other professional organizations/associations which helps with exposure, as well as the introduction of different perspectives on the industry.
• Providing resources and support to struggling Sections to rebuild interest and participation.
• Facilitation of open communication with the Sections to transmit critical information from the broader organization and additionally allow for Sections to voice concerns they might have or challenges they might be facing.
Abhi Datta is a seasoned consultant and a project controls professional who has spent his career in project controls for large infrastructure project in Oil & Gas, Mining and infrastructure sectors. He has worked on projects in Asia, Europe, Australia and US. He brings value to his clients as he started his career as a project engineer for a contractor, then worked for project management consultants, strategy consulting firm and currently the Project Controls Manager for the Westconnex program of works, a mega project in Australia with Capital value of 16.8 Bn AUD. He is also a lecturer/tutor at University of Technology Sydney and takes active interest in coaching and mentoring. He has been actively mentoring UNSW (University of New South Wales) and UTS (University of Technology, Sydney) students for over five years now. He has been the National Secretary for Engineers Australia's cost engineering society for three years. During his tenure as the National Secretary for Engineers Australia's Cost Engineering Society, he has seen some outstanding achievements. His service to industry and members in the advancement of Project Controls and the Cost Engineering profession continued through several promotional events, technical seminars and facilitating professional development for young project control professionals. He was in the organizing committee for the Project Controls Conference held in September 2017 at Sydney. It was a resounding success, bringing together over 300 delegates to share ideas, learn developments across industry and hear conference speakers and attend masterclass workshops over the 3-day event. This was the first ever Project Controls conference held in Australia. He has a Civil Engineering degree and MBA from University of New South Wales (UNSW) Sydney, Australia. He has a young family and lives in Sydney. On a side note, Abhi loves doing improv comedy (he has a group in Sydney he performs with) and is presently learning Mandarin.

GOALS AND OBJECTIVES:
My goal is to be a voice for the sections on the Board and to really bring out the potential for project controls excellence from countries like China, India and other countries within this region. There are mega projects being built in this region with a fantastic opportunity to raise awareness about project controls and AACE. Thus, I want to connect our section leaders with one another to share best practices in section management, so that they can provide the best resources for our membership. I hope to bring a fresh perspective to the board working in a region where several mega projects are underway.

Sankar is a postgraduate in Construction Management from College of Engineering, Guindy, Chennai, India, having more than 22+ years of qualitative experience. He is member of AACE since 2012 and holding EVP Certification since 2013. Sankar was the President of South India Section and is the Chair of India Taskforce. He is working closely with the Indian Institute of Technology Madras and Delhi to assist the section. Under his leadership as Section President, he obtained section sponsorship from the Karle Infra board, the real estate arm of Karle Group based at Bangalore, India. This enabled the section to have an office address in India, sponsorship for conducting meetings and conferences, secretarial and administrative support. Sankar has partnered with PMI Chennai Chapter. The South India Section conducted two successful national level conferences at IIT Madras and organized several workshops. Sankar initiated combining the three sections North, South and Central Sections in India and created a combined India Section to provide better services. Sankar works very closely with Indian government, academia and private organizations to promote the section in India. Sankar has registered the section as non-profit organization with Registrar of Companies, India, opened a bank account for the section and GST registration to bring serious commitment from the section to the Indian market. Sankar is also a Fellow of Institution of Engineers, India, and advisor of PMI’s Engineering and Construction forum of Bangalore India Chapter.

GOALS AND OBJECTIVES:
My goal is to make a mark in the chosen field and give back much more than what I have gained.

- Lay foundation for making Region 8 as the largest region in terms of membership and revenue in the next 7 to 10 years. This can be achieved by collaboration between various sections, closely work on knowledge sharing, international connections and networking.
- Establish networking opportunity as one of the key membership benefit.
- Work closely with educational institutions, take TCM knowledge to universities in Region 8, catch the engineers when they are young, implant the cost engineering seed when they are studying. This would be the greatest way to ensure future professionals aligned with AACE.
- Lead the initiative of creation of platform for cross pollination cost engineering knowledge between institutions across the regions through AACE.
- Working closely with the governments, both federal and state, conduct orientation programs to the key government staff and decision makers, introduce AACE knowledge capital to them.
- Form regional committees, develop country specific cost engineering solutions using AACE's knowledge capital.
**OSCAR SILES CHAVEZ**

- Electrical engineer.
- PMP certification.
- Master in Management TIs e-business (Spain).
- Master in Projects for Development (Bolivia).
- Master of Security and National Defense/DAEN (Bolivia).
- Member of the PMI (Project Management Institute).
- Member of the IIBA (International Institute of Business Analysis).
- Member of AACE (Association for the Advancement of Cost Engineering International).
- Arbitrator of the Conciliation and Arbitration Center of Cochabamba (Bolivia).
- Specialization and Investigator in Business Analysis (India)
- Specialization in Total Cost Management TCM (AACE Recommended Practices).
- Past VP Chapter PMI Santa Cruz Bolivia.
- Founding President of the AACE Bolivia Section.
- Founding Leader of the Community Business Analysis Chapter PMI Santa Cruz.
- Teacher of masters in national and international universities.
- +22 years of experience in oil & gas, petrochemical and telecommunications industries.
- Senior Consultant and Trainer in Strategic Portfolio and Project Management (PMO, OPM3, PROG, PORTF, BA, FEL-EPC, TCM).

**GOALS AND OBJECTIVES:**

- Consolidate the current Sections in LATAM (promote more dynamism in each Section).
- Promote the creation of new Sections in LATAM, for example Ecuador, Argentina, Mexico and others.
- Add greater added value to the memberships in LATAM, through integration activities between Sections (shared webinars, translated documents, etc.).
- Consolidate the development of translation into Spanish of the TCMF and the RPs, through the formation of work teams in each Section, to later integrate as Region 10.
- Seek greater benefits for the members of LATAM in relation to the cost of membership (reduce the annual subscription fee, which is accessible according to the economy of the countries of the region).
- Implement a clear and integrated marketing strategy to attract new members in the Sections of region 10, showing the benefits of belonging to the organization.
- Implement an integrated strategy among the Sections of Region 10 for the retention of current members.

**CARLOS ORTEGA**

Carlos is a Civil Engineer with two master’s degrees, a Master of Engineering Management, and an MBA. He has more than 16 years of experience, primarily in project management and claims analysis, working for Australia, US, Brazilian and Colombian companies. In 2017, he led the creation and registration of the AACE Colombia Section, and is currently the Section President. He is also part of the Spanish Translation Task Force, currently translating RPs into Spanish. He also co-lead of the World Economic Forum Infrastructure Advisory Committee for Argentina.

**GOALS AND OBJECTIVES:**

My main goal is to help assist Region 10 sections to strengthen their services offering to their members, though webinars, courses and site visits, which in turn should result in a higher number of membership applications. I also intend on assisting these sections to increasing attendance to their local yearly events, by promoting better partnerships with sponsors, and helping bring key speakers to these events.
ABSTRACT
Windows Analysis is a term that has been used (and misused) frequently to refer to various, and in many situations very different, delay analysis methodologies. Other papers under the Forensic Schedule Analysis (FSA) series, related to this article, address various implementations and derivatives of analysis methods that use the windows analysis approach. This article focuses on the usage of modified and/or recreated schedules, mostly after the fact, as a tool to analyze delays. This article explains the various derivatives of this method, discusses their strengths and weaknesses and addresses the challenges that may face an analyst in carrying out this type of analysis. Further, the article provides useful recommendations to assist the analyst in deciding whether this method is suitable for the case at hand and outlines the objectives and expectations when using this method. This article was first presented at the 2017 AACE Annual Meeting as CDR-2662.

INTRODUCTION
This article is one of a series of papers prepared to elaborate on the Method Implementation Protocols (MIPs) that are described in AACE International’s Recommended Practice 29R-03 (RP 29R-03). The first section of this article, which describes the details of the method implementation, parallels many of the subsections under the MIP 3.5 section of RP 29R-03 [1, pp. 66-71]. The remaining sections discuss variations of the method, its suitability/applicability, its relationship to other methods, and conclusions. The intent of the article is to provide an initial basis for the development of more detailed implementation guidance for MIP 3.5.

Making extensive modifications or recreating schedules after a project is completed places a significant burden on the analyst. In implementing MIP 3.5, the analyst creates a model of the plan for events that have already occurred, and then analyzes that model. The analyst may then determine responsibility for delays or other impacts based on an analysis of a model created “after the fact.” It is reasonable to assume that conclusions drawn from an analysis implementing MIP 3.5 could face significantly higher challenges regarding bias and credibility, compared to analyses that start with schedules that are validated business records from the project parties, obtained through discovery or another process related to dispute resolution.

Simply put, all of the other MIPs require an actual project schedule as an input for analysis. Only MIP 3.5 allows the analyst
to create a model of the project plan from scratch. MIP 3.5 exists to allow for delay analysis to be applied even in cases when a valid project plan was not created or is otherwise not available at the time of the analysis. Considering the level of scrutiny that a plan created "after the fact" is likely to face, any decision to implement MIP 3.5 requires due consideration.

**DETAILS OF METHOD IMPLEMENTATION**

**DESCRIPTION**

RP 29R-03 provides six paragraphs describing MIP 3.5, beginning with a statement that, "MIP 3.5 looks like MIPs 3.3 or 3.4 except that it uses contemporaneous schedule updates that were extensively modified or 'updates' that were completely recreated. MIP 3.5 is usually implemented when contemporaneous updates are not available or never existed" [1, p. 66]. Despite the fact that the analysis performed in MIP 3.5 may look like other MIPs, the RP is clear that MIP 3.5 is fundamentally different in that it may not use contemporaneous schedules, but may rely on a model created after the fact.

The RP's description of MIP 3.5 implies that the analyst will need an understanding of MIPs 3.3 and 3.4 in order to complete an analysis under MIP 3.5. Once the schedule to be analyzed is created, the analysis itself will proceed in a similar fashion as described in the guidelines for those MIPs. Interestingly, the distinction between MIP 3.3 and 3.4 with respect to logic modifications may disappear, considering the fact that the entire schedule, including all the logic, is extensively modified or recreated at the start of the analysis. In creating a schedule after the fact, the significant consideration should be given to whether the analyst is modeling the plan as the project participants might have created and documented at the time.

**COMMON NAMES**

Four of the common names associated with MIP 3.5, namely "Update Analysis," "Month-to-Month," "Window Analysis," and "Windows Analysis," offer no clear distinction with the other MIPs. The RP indicates that analyses termed "Reconstructed Update Analysis" or "Modified Update Analysis" are associated with MIP 3.5, and these common names are not associated with any other MIP. These names explicitly emphasize the fact that logic was developed or changed as part of the analysis. That is the primary feature of analysis under MIP 3.5.

The other common names listed in the RP for MIP 3.5, namely "Update Analysis," "Month-to-Month," "Window Analysis," and "Windows Analysis," are listed so the analyst is aware of the various names used by practitioners, but these names are not necessarily what the RP recommends to use when referring to MIP 3.5. Therefore, throughout this article, the authors use the term "Reconstructed Updates Windows Analysis" and "Modified Updates Windows Analysis" to refer to these sub- implementations under MIP 3.5. That is when updates are reconstructed or modified, respectively. The authors believe it is important to use the most relevant names for the analysis consistently to avoid confusion and to ensure a proper naming convention for the methods is respected.

**SOURCE VALIDATION PROTOCOLS IMPLEMENTATION**

For all other MIPs, the Source Validation Protocols (SVPs) are applied in an effort to validate contemporaneous information to establish that it is suitable to be used as an input into a forensic schedule analysis. For MIP 3.5, the application is, in effect, reversed. In order to modify or recreate schedules after the fact, the analyst must first demonstrate that contemporaneous information either does not exist or is not suitable for use in a forensic analysis.

Of course, if absolutely no contemporaneous information on the project existed, it would not be possible to conduct an analysis. There must be some basis of information for creating the schedules to be used in MIP 3.5, and that information should be subjected to the SVPs.

The SVPs recommended for MIP 3.5 are: [1, 67]

1. Implement SVP 2.3 (update validation) and,
2. Implement SVP 2.3 D.1 or D.2 (reconstruction) and,
3. Implement SVP 2.1 (baseline validation).

Taking SVP 2.1 as an example, the protocols outlined in the RP may provide some basis for the selection and application of MIP 3.5. In applying SVP 2.1, the analyst may conclude that no baseline schedule was created on the project or that the schedule created does not constitute a 'conformed plan' for the project (SVP 2.1, Point 1); that the schedule logic is incomplete (i.e., there are many open ends in the network; SVP 2.1, Point 5); or that the schedule does not model the full scope of the project (SVP 2.1, Point 6). The identification of significant flaws in a contemporaneous schedule is the likely starting point for any argument that the schedule must be extensively modified prior to use in an analysis.

SVP 2.3 recommends that the analyst "assemble all schedule updates so that they cover the entire project duration from start to finish or up to the current real-time date." (SVP 2.3, Point 2) As both MIP 3.3 and MIP 3.4 recommend implementation of SVP 2.3, a question is raised regarding what action should be taken in the event that the entire project duration is not covered. This issue is further explored in the sections of this article that discuss the suitability/applicability of MIP 3.5 and its relationship to other methods.

SVP 2.3.D provides guidance on reconstructing and modifying project schedules for use in an analysis. [1, 29] Therefore, this section of the SVPs is specifically applicable to MIP 3.5. However, this section of SVP 2.3 also addresses more minor changes to project schedules, such as correcting an inaccurate status date. Significant discussion occurred in relation to the development of the RP regarding what level of change might be necessary before some “threshold” was breached, and an analysis characterized under MIP 3.3 or 3.4 might be better characterized as MIP 3.5. Clearly, schedules that are created wholesale after the fact would fall under MIP 3.5, but it is not clear what level of modification is necessary to meet the 'extensively modified’ threshold discussed in the description of MIP 3.5.

**ENHANCED SOURCE VALIDATION PROTOCOLS IMPLEMENTATION**

The enhanced SVPs recommended for MIP 3.5 are: [1, 67]

1. Implement SVP 2.2 (as-built validation)
2. Implement SVP 2.4 (identification of delay events)

SVP 2.2 is listed among the enhanced protocols because MIP 3.5 does not rely upon the as-built schedule as the starting point of the analysis. The schedules created after the fact will not necessarily model events exactly as they occurred. Instead, they should represent an attempt to model a reasonable plan for the work at the time just
before it was performed. Still, any significant discrepancy between the retrospectively created plan and actual events is subject to scrutiny. Detailed review and validation of as-built information is likely to be beneficial in preparing for that scrutiny.

SVP 2.4 is listed among the enhanced protocols because MIP 3.5 remains among the observational methods. While the model for the plan may be created after the fact. The distinction between the observational methods and the modeled methods is related to the analysis of the delays themselves. As stated in the description of MIP 3.5, the delay analysis implemented once the schedule is modified or recreated may proceed according to the protocols of MIP 3 or 3.4, which are observational analysis techniques. Still, identification of delays through means other than schedule analysis is likely to aid the analyst in ensuring that project delays are appropriately addressed in the analysis. Clearly, an understanding of the delays that are at the heart of any dispute will be helpful in analyzing them, especially if that analysis is based on a model that was created after the fact. However, some practitioners believe that delays should be identified as a result of the analysis and not as part of the SVPs that are performed on inputs into the analysis.

MINIMUM RECOMMENDED PROTOCOL IMPLEMENTATION
The minimum recommended protocols for MIP 3.5 are very similar to those recommended for MIPs 3.3 and 3.4. Again, once the schedule is modified or recreated, MIP 3.5 may be indistinguishable from MIPs 3.3 or 3.4.

ENHANCED PROTOCOL IMPLEMENTATION
The enhanced implementation protocol under MIP 3.5 references the reader to the daily progress method. The noted reference is to subsection 3.3.E.1, but should actually refer the reader to subsection 3.1.F.1 or 3.2.E.1, where these techniques are described. The techniques outlined give guidance on how to parse activity progress for any of the observational MIPs.

CONSIDERATIONS AND CAVEATS
The most important caveat for any analysis that relies upon schedules that are extensively modified or recreated after the fact is that those schedules will lack the "reputable presumption of correctness attached to CPM’s upon which the parties have previously mutually agreed" [2, p. 234]. A few examples of analyses that relied upon modified or recreated schedules may serve to inform the analyst regarding the risks to manage when schedules are modified or recreated.

The first case regards the construction of the Cedars-Sinai Medical Center, which occurred between 1972 and 1976 [3, pp. 401-411]. The owner had retained a CPM scheduling firm approximately half-way through construction to prepare a schedule to document the contractor’s plan retrospectively. The schedule was prepared in the summer of 1974, but documented a plan going back at least to the beginning of 1974. The “schedule did not take the project as it found it in the summer of 1974 . . . but rather hypothesized what progress should have been made from January 1974 to the summer of 1974” [3, pp. 401-411]. Moreover, project records indicated that the schedule was prepared with the intent of protecting the owner against payment of time extensions. The analysis was not well received, and “summary judgment was granted to the contractor with respect to this issue of claims for delays in advance of the contract completion date” [3, pp. 401-411]. Although the schedule in this case was not prepared after the entire project was completed, it was prepared by a third-party analyst, after critical delays had occurred, and for the purpose of dispute resolution, as opposed to construction management. Given those conditions, the effort could be characterized as an MIP 3.5 implementation, albeit a poor one. This example demonstrates the importance of modeling plans objectively and with the expectation that they will be subjected to significant scrutiny for error, omission, or bias.

In the case of Gulf Contracting, Inc., which involved the construction of military barracks and related facilities, modifications made to a schedule after the fact were accepted as reasonable [4, pp. 236-237]. The first modifications cited in this case were characterized as "minor logic corrections" made to create “a reasonable as-planned schedule.” The analyst “then adjusted the approved CPM schedule by incorporating the impact of five activities he identified as impacting the critical path of the project” [4, pp. 236-237]. The referenced text cites this case as an example to “emphasize the use of current updates of the CPM schedule at specific reference points during the life of the CPM project.” Interestingly, it appears that the CPM schedule that was analyzed was modified by the analyst in order to create a “current update” to analyze [4, pp. 236-237]. Many analysts that make changes to schedules after the fact, state that the changes are minor, are necessary to correct errors in the schedule, or some combination of these two reasons. In this case, it appears that the changes were considered reasonable and necessary, and the analysis was found “to be straight-forward and supported by the record” [4, pp. 236-237]. Analysts that make modifications to schedules to correct errors may argue that the changes do not cross the threshold for extensive modification, and that the analysis was implemented under MIP 3.3 or 3.4, as opposed to MIP 3.5.

MODIFIED VS. RECONSTRUCTED UPDATES
When it is established that MIP 3.5 is suitable for the purpose of a particular analysis, the first step the analyst has to decide upon is whether the implementation should be based on Modified Updates, Reconstructed Updates, or even use both implementations in different windows of the same analysis, if necessary. The authors’ recommendation is that using Modified Updates is the first option to be considered, and only when this option is found to be unsuitable or unfeasible, due to one or more reasons as discussed in this article, should an analyst consider moving to a Reconstructed Updates implementation. The governing principle to make such a decision is that any modifications to the project schedules should be driven by necessity and kept to a minimum.

The differences between MIPs 3.3, 3.4 and 3.5 are mainly in the preparation steps and in the analysis parameters and assumptions that an analyst will set out, such as which schedules to use, periods between updates, and so on. Once that is established, the steps undertaken to identify, measure and assign delays are generally identical between the aforementioned MIPs. Such steps, generally, revolve around the following:

- Locate the critical path in the studied period of analysis and subsequently identify the critical activities.
- Compare the planned progress against the actual and/or forecast progress for the critical activities within the period of analysis.
- Subsequently, identify the period of critical delays.
- Assign the identified periods of critical delays to the known events that were operative within the period of analysis and were driving the delayed critical activities.
It is no surprise, therefore, that the analysis results mainly hinge on the identification of the critical path in the period of analysis under consideration, assuming the set of facts established are the same between these MIPs, of course. The preparation steps taken and the assumptions set out by the analysts are the main factors that may result in a different critical path being identified, and consequently, each analysis may yield a different result.

Under MIP 3.5, Modified Updates implementation may result on a different critical path being identified in the window/period under consideration than a Reconstructed Updates implementation, and similarly both implementations under MIP 3.5 may have different critical paths identified than MIP’s 3.3 and/or 3.4.

As discussed earlier in this article, SVP 2.1 of the RP provided some guidance and circumstances under which MIP 3.5 can be used. In the remainder of this section, the authors elaborate on this guidance and give specific guidance related to each of the sub-implementations of MIP 3.5, as follows:

MODIFIED UPDATES WINDOWS ANALYSIS

The salient principle that justifies using MIP 3.5 is that the readily available schedules and/or schedule updates are flawed, unreliable and/or questionable. In general, the readily available schedules are not in a state to be used for a forensic delay analysis as they stand. The extent of intervention by analysts to modify (or reconstruct as discussed below) depends on the degree of unreliability identified in the available schedules.

Each of the following circumstances, for example, may signal to the analyst that the Modified Updates Windows Analysis is suitable for the case at hand:

- The updated schedule(s) relevant to the period of analysis is affected by noticeable out-of-sequence activities that caused logic and critical path anomalies.
- Significant unsubstantiated amendments to the initial baseline during the update cycles, including but not limited to, logic amendments, added activities, delete activities and the like.
- Contemporaneous records and/or evidence that suggest the contemporaneous updated schedules were questionable and/or unreliable in their current status; for instance, valid rejection and/or challenge by the owner against the update(s) or evidence that suggest the contractor manipulated the updates either for his benefit or as a result of unsubstantiated pressure from the owner not to show delays to the updated schedules.
- Where it is established that the update(s) and/or the initial baseline missed scope of work, especially where the missing scope is relevant to the delay events that are being analyzed.

RECONSTRUCTED UPDATES WINDOWS ANALYSIS

On the other hand, these circumstances, for example, may signal to the analyst that the Reconstructed Updates Windows Analysis is suitable for the case at hand:

- Initial baseline is available, however, the baseline was not updated during the performance of the project.
- Initial baseline is available and a number of updates were prepared during the performance of the project; however, the update cycle (period between the available updates) is significantly longer than what would allow sensible periodical analysis to be carried out and/or when it is imperative to identify the critical path switches between updates. The analyst, therefore, may need to reconstruct update(s) between the available updates, based on the initial baseline, the progress information and project records of the actual status at the desired update Data Date.
- No baseline is available and the case at hand requires forensic examination of the critical path based on a dynamic approach. Where this situation occurs, it is recommended not to overcomplicate the reconstructed schedule. It is also crucial for the analyst to ensure that the reconstructed schedule reflects, as possible, the contemporaneous understanding of the parties and the initial intent of the contractor. It is advisable and desirable to have agreement on the reconstructed schedule between involved parties, if at all possible, before embarking on the analysis. This situation is easier when the analyst is entrusted by both (or all) relevant sides. For example, when the analyst is appointed by the owner and the contractor to carry out the analysis, as opposed to being employed by only one side.

SAMPLE PROJECT – EXAMPLE

The following sample project has been developed to illustrate, in simple terms, the Windows Analysis steps and MIP 3.5. The project consists of a three-story building being built on two adjacent areas, Area A and Area B. The construction of each area can proceed independently, however, both areas have to be complete for the project to be considered as complete. For the purpose of this article, it is assumed that the baseline schedule was developed using a spreadsheet software package in a bar chart format without logic links, which was submitted in hard copy to the owner in the bid document. It is also assumed that there were no updated schedules developed during the performance of the project. However, the contractor was submitting, frequently, project records of the actual progress, in the form of photographic reports, inspection requests for completed works and other supporting evidence. The available records of actual performance were generally accepted and were not disputed by either side, the contractor or the owner.

The project planned start is 19 January 2017, and the contractual completion is 26 July 2017. The project started as planned, however, various delays occurred during the early phases of the project and the project completed on 11 August 2017.

The analyst started by creating the baseline schedule, following the contractor’s initial intention expressed on the provided bar chart. In addition, in accordance with the available progress information, the analyst was able to create updated schedules at certain pivotal points and subsequently divided the period of the project into two windows of analysis. The first window covers the period from the start of the project on 19 January 2017 and ends on 1 May 2017. The second window covers the period from 1 May 2017 to the actual completion on 11 August 2017.

The baseline schedule is summarized in Figure 1 (see following page). As can be noted from Figure 1, the critical path runs through the construction works in Area B.

The constructed update as of 1 May 2017 is summarized in. It can be seen from Figure 2 that as of 1 May 2017, the project completion is forecast to be delayed to 11 August 2017, which coincides with the actual completion of the sample project.

THE ANALYSIS STEPS

The first step in the analysis is to identify the critical path. From the baseline schedule and the first updated schedule, it can be concluded that the critical path runs through Area B. The second step is, therefore, to analyze the delays that occurred to Area B activities in Window 1.
Figure 3 shows the actual progress of the Area B activities (the blue bar) against the baseline activities (the yellow bar), in the period from the start of the project to 1 May 2017 (i.e., Window 1). Figure 4 shows some relevant dates and information for...
these activities. In this figure, the suffix ‘A’ in the dates columns marks an actual date, as opposed to a planned or forecast date.

Starting the analysis from the first activity, Activity ID A1140 ‘Area B – Excavation’, it can be noted that the excavation works in Area B suffered a 3 working days delay, which transpired to 5 calendar days since the activity actual finish date is 20 February 2017, as opposed to baseline finish date of 15 February 2017. The delay in this activity pushed the start of its successor activity by 5 calendar days.

Continuing the analysis, Activity ID A1150 ‘Area B – Foundation work’ suffered a total delay of 12 calendar days (from the baseline finish of 22 March 2016 to the actual finish of 3 April 2017). However, it should be noted that the 12 calendar days delay include the 5 days which were passed on to Activity ID A1150 from its delayed predecessor Activity ID A1140. Therefore, the delay that occurred to ID A1150 is a further delay of 7 calendar days. Similarly, it can be noted that the last activity in Window 1, Activity ID A1160 ‘Area B – Ground Floor Slab’, suffered a further delay of 6 calendar days.

In summary, the critical delays during Window 1 are as shown in Table 1:

<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Critical Delays</th>
<th>Window 1 Total delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1140</td>
<td>5 calendar days</td>
<td></td>
</tr>
<tr>
<td>A1150</td>
<td>7 calendar days</td>
<td></td>
</tr>
<tr>
<td>A1160</td>
<td>6 calendar days</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 1. Summary of the Sample Window of Analysis

The last step in the analysis is to establish cause to the identified delays. In observational analysis techniques, such as MIPS 3.5, this is often done by carrying out a thorough investigation of the project documentation to identify the events that caused and/or contributed to the identified delays. For instance, a record of encountering unforeseen ground conditions may have caused the delays in excavation work in Area B. A change order to add additional reinforcement to the foundations is a potential delay to the foundation work, and so on.

The analysis is then continued in the same way in subsequent windows. For the purpose of this article, it is assumed that all the delays were encountered in Window 1 and no further delays were encountered in the project.

VARIATIONS OF THE METHOD

Whether the analyst uses the Modified Updates Windows Analysis or the Reconstructed Updates Windows Analysis, or mixes both sub-implementations through the overall period of analysis, as the case may require, there are other factors to decide and variations to choose from. The RP suggests that these variations also exist under MIPS 3.3 and 3.4. These variations primarily relate to the selection of periods/windows of analysis, and are as follows:

VARIATION 1 – FIXED PERIODS

Under this variation, the analyst may select the windows of analysis consistently using fixed periods from the start to the end of the analysis. For instance, the analyst may decide to select the windows of analyses each week, bi-weekly, monthly, bi-monthly or any other period. Generally, this variation is suitable when it is reasonable to respect a regular update cycle, provided of course that the project updates were prepared and issued periodically and the update cycle was almost fixed throughout the project.

VARIATION 2 – VARIABLE PERIODS

Under this variation, the selected windows of analysis will vary and the duration of each window will be different than other windows. The selection of windows under this variation may be driven by the availability of updates, which may have been prepared and issued during the performance of the project sporadically. This variation is also suitable when it is more important to respect the different stages of the works and/or milestones, for instance, foundation stage, super structure, finishes, and so on. This variation is also suitable when the issues that need to be analyzed do not necessarily require a very detailed analysis during one or more periods (for example, during a period with no delays or no disputes). Addressing different periods in different levels of detail may reduce the analysis time and cost.

FIXED PERIODS VS. VARIABLE PERIODS

The RP notes that a Fixed Periods implementation is more favorable and more precise than a Variable Periods implementation. This is mainly because of two reasons: first, the latter provides more room for manipulation and misuse which some analysts may adopt to yield more favorable results to the party they represent. Secondly, adopting a Variable Periods implementation, particularly when the periods are unreasonably long, is likely to overlook the critical path switches resulting in the analyst making incorrect assumptions as to what is the correct critical path(s) for certain periods of analysis. However, provided that the Variable Periods are based on valid reasoning and that the periods are not significantly long, the authors suggest that the Variable Periods is a valid variation that may be used when applicable.

SUITABILITY / APPLICABILITY

While the analyst takes a risk in foregoing the presumed correctness of the CPM by modifying or recreating it after the fact, there may be cases where the application of
MIP 3.5 is reasonable and necessary. Courts have concluded that “Reliance upon an incomplete and inaccurate CPM” is not an appropriate way to evaluate delays. [5] Given that, it follows that an analyst faced with an inaccurate or incomplete CPM would take steps to remedy it, and MIP 3.5 exists for this reason.

Certainly, the threshold for demonstrating that MIP 3.5 should be applied will be higher the more information is available. In applying MIP 3.5, the analyst is implicitly or explicitly stating that the contemporaneous information is an insufficient basis for analysis. Something must be modified or something more must be created. Therefore, the quantity and quality of the available contemporaneous information is the primary driver in determining the applicability of MIP 3.5. The more contemporaneous information that is available, the more questions may be asked regarding any MIP 3.5 implementation.

Available contemporaneous information may include the project plan (contract scope of work, proposal, written execution plan, correspondence, etc.) and information regarding actual events (reports, meeting minutes, deposition testimony of project participants, etc.), but may not include CPM schedules. In this instance, any mathematical schedule analysis must first create the schedules to be analyzed. Several example scenarios follow.

SCENARIO 1
A project was managed using a CPM schedule, which was updated monthly, but three sequential monthly updates were deleted. Other project records explicitly indicate that logic changes were made in each of these monthly updates and that the forecast for the project changed as a result of those logic changes. How does the analyst incorporate this information into the analysis? Should the analyst attempt to re-create one or more of the missing schedule updates, or should the analyst seek to rely on the available schedules, knowing that those schedules do not reflect the contemporaneous plan? How is this troublesome period of the project to be analyzed? If analyzing this period is crucial in the overall analysis, then MIP 3.5 could be the only option for the analyst.

SCENARIO 2
A project was managed using a CPM schedule, which was updated monthly, but all of the schedules are only available to the analyst as printed bar charts, without underlying logic information. Should the analyst attempt to create a schedule network using CPM software? Or should the schedules be analyzed without relying on CPM techniques? What other analysis options are available? Of course, other analysis options that are non-dynamic based could be useful in such circumstances. However, if the project is of such complexity that a dynamic based approach is necessary, then again, MIP 3.5 could be the most suitable option.

RELATIONSHIP TO OTHER METHODS
As discussed in this article, MIP 3.5 is an observational technique, closely related to MIPs 3.3 and 3.4. The primary distinction is that the schedules being analyzed are extensively modified or recreated after the fact. Such schedules will be subjected to significant scrutiny for error, omission, or bias.

CONCLUSION
There is a presumption of correctness attributed to schedules created during a project, to which the parties have previously mutually agreed. No such presumption of correctness accrues to schedules that have been extensively modified or recreated after the fact. Still, an analyst cannot rely on materially incomplete or inaccurate CPM schedules to analyze delays, even if those schedules were created and accepted by the parties contemporaneously during project execution. In these instances, it may be necessary to modify or recreate schedules after the fact in order to produce a credible analysis. When the analysis necessitates the modification or recreation of schedules after the fact, the analyst should be well prepared to demonstrate the necessity for the modification or recreation of these schedules and to defend against allegations of error, omission, or bias. When implementing an observational analysis technique, the preference of every analyst should be to use the contemporaneous schedules as they were prepared, reviewed or accepted, and used on the project.

REFERENCES
1. Hoshino, K. et al., 2011, Recommended Practice No. 29R-03, Forensic Schedule Analysis, April 25, 2011 Revision, AACE® International, Morgantown, WV.
4. Wickwire, J. et al., 1991, Construction Scheduling, Preparation, Liability, and Claims, Pages 236-237, John Wiley & Sons, Inc., New York, Referenced case: ASBCA Nos. 30,195, 32,839, 33,867, 89-2 BCA ¶ 21,812, at 109,755-756, on reconsideration, 90-1 BCA ¶ 22,393 (1989), Note: Based on the description of the analysis, the steps taken might be characterized under MIP 3.3, MIP 3.5, or MIP 3.6, depending on the exact details of the analysis conducted. In fact, the analyst in this case might disagree with any of those characterizations. RP 29R-03 SVP 2.3.D.3 states that, making changes to a schedule for the purpose of an analysis does not necessarily classify the analysis under MIP 3.5.

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GREATER CAIRO SECTION

Since October 18, 2018, the Greater Cairo Section underwent a leadership change and is determined to be among the top recognized sections of AACE International’s global community. In less than two weeks after the leadership change, the section board held three meetings and set a 3-month plan in motion with the target of revitalizing the section with as many activities as possible in a small timeframe. The plan includes a series of technical meetings, contribution to draft recommended practices, several outreach activities, training events in delay analysis and cost management, participation with technical papers and presentations in the annual Conference and Expo of 2019 and several charity events. The plan is aggressive, but the Greater Cairo Section is up to the challenge. As of October 2018, the section is comprised of only 15 members but aims to expand through the remainder of 2018 and throughout 2019 with its reactivation. The section is hopeful that a more elaborate update will be provided in the next edition of the Source.

Above: Shown above officers of the Greater Cairo Section meet for a section board meeting at the iconic Grand Egyptian Museum Project, with the pyramids in the background. From left to right: Ahmed Afifi, Section Vice President, Technical; Waleed El Nemr, Section President, and Ahmed Gamal, Section Director, Membership.
LONG ISLAND SECTION

On November 6, Dr. Amin Terouhid presented AACE Recommended Practice 92R-17, Analysing Near-Critical Paths, to the Long Island Section. Shown above from left to right are: Thomas Sinacore, CCP CFCC PSP; Dr. Amin Terouhid, DRMP PSP; Kyle Street, Long Island Section Member; Laura Guidice CCP PSP; Kevin Hart, Long Island Section Member; and seated is Sal Bousleiman, CCP. In attendance but not in the photo were Joseph Wallwork, CCP CFCC PSP and Mike Bauerschmidt, CST.

NEW JERSEY SECTION

On September 27, the New Jersey Section hosted its first technical session of the fall season. The meeting was run by Michael Bennink, President of the New Jersey Section. Fifteen project controls professionals, including a few new members, gathered for networking and dinner at a local restaurant. The speaker was Dr. Amin Terouhid, PE. Amin is the President and Principal Consultant at Adroit Consultants, LLC, has a PhD in construction management, and holds the following certifications: Professional Engineer (PE), Project Management Professional (PMP), Decision and Risk Management Professional (DRMP), Planning and Scheduling Professional (PSP), and Green Globes Professional (GGP). Amin is the primary author of AACE Recommended Practices 89R-16 (Management Summary Schedule), 92R-17 (Analyzing Near-Critical Paths), and 91R-16 (Schedule Development). At the section meeting, Amin presented the recently published RP 92R-17: Analyzing Near Critical Paths. Amin provided guidance on analyzing near-critical paths. The presentation included discussing the significance of near-critical paths, demonstrating how to determine the near-critical paths, and the recommended analysis method for tracking, trending, and analyzing the near-critical paths.

Both section meetings were a success. Upcoming New Jersey section events will include a webinar in November, a technical presentation and Holiday Get Together in December, and a networking event/technical session in February with the local ASCE Central Jersey Section and the Raritan Valley Society of Professional Engineers.
The Qatar Section organized a technical session on October 17, hosting HKAs Country Manager Tom Kapapa as the speaker to explain the ingredients for “Making a Successful Claim in Qatar.” The section welcomed over 70 construction professionals to the event. The presentation focused on the key factors affecting the success of a claim, rather than the technical details of its preparation. “Each claim is a business and a product that you are trying to sell to the corresponding party” said Mr. Kapapa. The content of the speech dealt with the importance of: knowing your client, simplicity of submission, follow-up after submission, and communication with the client. Time allowed for questions and answers from the audience where Tom gave some useful insights using real life examples in the current market.

Mr. Kapapa is HKAs Country Manager in Qatar and has over 20 years of experience in the construction industry, specializing in quantum and delay analysis. Tom’s sectoral experience includes major commercial and leisure developments, infrastructure, oil & gas, health, industrial and commercial MEP works, roads/highway projects, water, waste water and power station construction. Tom can call on wide-ranging experience in several different geographical areas such as Middle East, South East Asia, UK, Europe and Africa.

In early September, Qantum Global Solutions Forensic Planning Director Lucia Vernon held a discussion on the topic of, ‘Time Impact Analysis in Windows - Concurrency Analysis’ for members of the Qatar Section. The presentation and subsequent discussion dealt with the controversial and perennial topic of concurrency when assessing extension of time and prolongation costs. As such the event was limited to AACE members only and capped at 30 attendees.

“Time Impact Analysis in Windows (TIA) is recognized as one of the most credible techniques for analyzing construction delays according to AACE MIP3.7 Recommended Practice 29R-03,” said Lucia in opening the presentation. ‘Members of AACE are familiar with this type of analysis used for concurrency analysis to prove contractor entitlement to prolongation costs where the critical path is investigated in a similar way to the ‘Time Slice’ method. This evening has proved a good opportunity to discuss this multi-faceted issue with an audience of industry professionals who manage some of Qatar’s major construction projects.

Lucia Vernon is an experienced Forensic Planning Director working as part of a team carrying out forensic delay analyses in several different countries, predominantly in the Middle East. She is an RICS certified expert witness and mediator. She currently holds the position of President for the Qatar Section and is actively involved with presenting good practice in delay analysis around Qatar and the Middle East.

Above: Qatar Section attendees at the October meeting included, shown seated from left to right: Milind Deshmukh –Qatar Section Director Administration/Project Monitoring Engineer at Lahmayer International; Manish Agrawal –Qatar Section Vice President/Planning and Cost Engineer at Energoproject Entel; Michael Dullaghan – Director Marketing and Publicity/Associate Director at Driver Trett; Lucia Vernon –Qatar Section President/Forensic Planning Director at Quantum Global Solutions; Avinash Gaikwad –Qatar Section President Elect/Managing Director at AG Consultancy; Ryan Tan –Qatar Section Secretary/Senior Planning Engineer at Harinsa Contracting Company. Standing from left to right are: Sahin Recan –Qatar Section Director Membership/Managing Consultant at HKA; Amro Ahmed –Qatar Section Director Events/Project Controller at ASHGHAL PWA; Anil Ipekci –Qatar Section Director Communication/Head of Planning at Gulf Contracting Company; Adieb Mahmoud –Qatar Section Director Education/Senior Quantity Surveyor at Louis Berger; Oleksii Liubymy –Qatar Section Director Mentoring/Senior Planning Engineer at Siemens; and Paul Gregg – Qatar Section Treasurer/Senior Consultant at Ankura.

Above: At the October Qatar Section meeting, Tom Kapapa, guest speaker and Country Manager at HKA Qatar, receives a speaker’s gift from Lucia Vernon, Qatar Section President and a Forensic Planning Director at Quantum Global Solutions.
Sean Vernon, Quantum Solutions Technical Manager - Qatar, recently presented ‘A quick look at Acceleration – What it is, When it Happens and What it Costs’ to the Qatar Section. The presentation and subsequent question and answer session discussed key issues affecting section members including what can lead to acceleration, how contracts and industry guidelines view acceleration, what are the actual costs of accelerating and who pays this according to the different scenarios that may arise.

In his opening address, Sean noted, “With Qatar forecast to spend more than US$ 200 billion on construction in the next decade with much of the money going towards the World Cup preparations in 2022 – time is money! While delays are commonplace in construction the acceleration of projects is an increasingly common, and worrying, variable for contractors.” The discussion allowed members of the section to debate the issues related to acceleration in their construction projects, including the different types of acceleration, who’s responsible for that acceleration and most importantly – who pays. Over 70 members of the section attended the technical presentation which was held at the Rotana City Center.

Sean Vernon is an experienced quantity surveyor, contract and claims manager, expert witness and RICS accredited mediator from a building and civil engineering background. Sean has over 30 years of experience working on projects ranging from small local authority refurbishment projects to a multi-million-dollar Engineering Procurement and Construction (EPC) nuclear power station. His experience in a wide range of areas from nuclear to housing refurbishment shows a flexibility and adaptability to the needs of a large variety of projects. Sean has good working knowledge of FIDIC, PWA and forms of contracts. Claims are a reality for all parties involved in construction contracts. Preparing, presenting, defending a claim and coming to a successful conclusion can sometimes be tricky.

Above: On September 19, the Qatar Section organized a technical session for the members only on the topic Time Impact Analysis – Concurrency Analysis. Shown above Qatar Section Past President Mohamad Daaboul presents Lucia Vernon, current section President, a speaker’s gift from the Qatar Section.
Left: Lucia Vernon, current Qatar Section President, was the speaker at the Sept. 19 Section meeting. Her topic was on the topic of Time Impact Analysis – Concurrency Analysis.
On Tuesday, October 23, the Southern California Section and ASPE Los Angeles Chapter organized a joint dinner meeting. Ron Miller, Executive Secretary of the LA OC Building & Construction Trades Commission presented on ‘Project Labor Agreements: How They Work in Public and Private Sector’. In the presentation, Ron discussed the evolution of Project Labor Agreements, current usage, benefits and future initiatives for project labor agreements in the region. This was a very informative session on project labor agreements directly from the leadership in the region. The meeting presented unique networking opportunities as it was attended by members of both AACE SoCal Section and ASPE Los Angeles Chapter.

The Southern California Section toured the $520 million, design-build-finance-operate-maintain Long Beach Civic Center Project. The project will replace the old city hall and provide efficient new offices for the Port of Long Beach, a new city library and a retail marketplace and public park that will serve residents and visitors of Long Beach for years to come. It is one of few projects constructed in California with the P3 public-private-partnership model including maintenance. Since the structures must be maintained for the next 40 years by the partnership, much of the design hinged on long-term cost benefits. With most public spaces typically being low hard bid, this delivery method allowed for material selections that in many cases were higher front-end costs, but with long-term savings in maintenance and efficiency. Attendees got an in-depth insight as to planning, design elements, special interior details and use of space. The simple elegance of the New Civic Center plan brings new state-of-the-art facilities, new residents and new vitality to Long Beach to make the Civic Center a place that’s truly “of and for the people of Long Beach.” The project is on track to obtain occupancy by June of 2019. After the project site tour, attendees attended a group dinner to network and socialized with other professionals. The tour had 18 members in attendance with a few students from USC.

Above: On Tuesday, October 23, the Southern California Section and ASPE Los Angeles Chapter organized a joint dinner meeting. Ron Miller, Executive Secretary of the LA OC Building & Construction Trades Commission presented on ‘Project Labor Agreements: How They Work in Public and Private Sector’.

Below: The Southern California Section recently toured the $520 million, design-build-finance-operate-maintain Long Beach Civic Center Project. The exterior of the new center is shown above.
South India Section conducted a knowledge sharing session on, “Understanding Risk and Cost Management of Major Projects,” on Sept. 15, at the IIT Madras campus. The session was delivered jointly by Peter Cox, Operations Director India, and R. M. Sundaram, National Director of WTP Cost Advisory Services. The session was well attended by people from the E&C and infrastructure industries and students from IIT, Madras. The presentation provided an insight into the risks and critical success factors associated with planning and managing sustainable smart cities and other major capital projects in order to produce world leading cities by reference to local and international experiences. The presentation also focused on the evolving landscape of contracting practices and how India is adapting to the latest international standards. The speakers touched on the application of economic and cost management principles to major capital investment planning, investment decision making and asset management, which are becoming widely adopted and recognized for their value addition and are helping private and public-sector agencies to plan future investments in a better manner, as well as more effectively manage and maintain such assets over their entire life cycle. The presentation was well received by the audience with positive feedback on the program.

At right: South India Section conducted a knowledge sharing session on, “Understanding Risk and Cost Management of Major Projects,” on Sept. 15, at the IIT Madras campus. The session was delivered jointly by Peter Cox, Operations Director India, and R. M. Sundaram, National Director of WTP Cost Advisory Services. Mr. Cox is shown above. Sundaram is shown at right.
DECEMBER 2018

SUBMITTING SECTION NEWS
We invite all sections to submit news and updates to be included in the International Bulletin section of each Source issue. Please submit any and all text as a part of the e-mail or as a Microsoft Word file attachment. Please submit any photos as individual attachments in JPG formats. Do not embed photos in Microsoft Word files. For photos to be used, we require either large original files or print size photos at 300 dpi (dots per inch). For photos to be published, they must be in focus, of print quality, and of sufficient resolution.

Please include the names and titles of each person shown in any photos. Please list names from left to right or refer to those shown as being above left or right. For group photos please list names from left to right, beginning with the front row and working to the back. All submissions should be e-mailed to editor@aacei.org. Please use the official name of the Section as approved by the AACE Board when the Section’s charter was approved. Within 2 to 3 business days of submitting a “Section News” item, you should receive a return confirmation e-mail that your submission was received at AACE headquarters.

MISSING SUBMISSIONS
Generally, all submissions received in the above scheduled times will be published in the listed issue. Questions about incomplete submissions or failure to follow these submission guidelines could delay publication. Text will be published without submitted photos if the photo does not meet the listed quality requirements. AACE reserves the right to edit all submissions and/or to refuse to publish any submissions determined by the Managing Editor or the Art Director to not meet the standards of the journal. Any appeals of these decisions will have a final decision determined by the Executive Director.

If a submission is not included in the designated issue, please e-mail or call the Managing Editor to ensure that it has not been lost or misplaced. Call or e-mail if you do not receive a confirmation e-mail within 3 business days of submission.

Source has a submission deadline of two months in advance of the issue date.

**Submission Dates**
- By Dec. 31
- By Feb. 28
- By April 30
- By June 30
- By Aug. 31
- By Oct. 31

**Publication Date**
- February
- April
- June
- August
- October
- December

Any Section representative with questions is advised to e-mail editor@aacei.org or call the Managing Editor during regular business hours, 9 a.m. to 5 p.m. Eastern Standard Time, Monday-Friday, except holidays and special closings.

**SPAIN SECTION**
On Sept. 20, a technical meeting of the Spain Section took place in SacyrFluor’s auditorium (Madrid), and for the first time the presentation was accessible via streaming, with people connecting not only from Spain but from Latin America as well. The topic covered by Gilberto Regal (Lead Planning Consultant in CAA) was the “Impact of New Technologies on Project Control Activities,” a very interesting presentation about 4D, 5D, virtual reality, robots, drones…. The speech was followed by a Q&A, being a very participative meeting. Afterwards, the more than 30 attendants gathered for a networking session sharing thoughts, experiences, food and beers. The next meeting will be on Dec. 11, talking about Montercarlo techniques.

Top: Gilberto Regal, Lead Planning Consultant in CAA, was the guest speaker at the Sept. 20 Spain Section meeting. His topic was about the “Impact of New Technologies on Project Control Activities,” a very interesting presentation about 4D, 5D, virtual reality, robots, drones. Above: After the Sept. 20 Spain Section meeting, more than 30 attendants gathered for a networking session sharing thoughts, experiences, food and beers. Above, left: Jorge Ruiz-Peinado, President of the Spain Section is shown above presenting Gilberto Regal, Lead Planning Consultant in CAA, a speaker’s certificate after Regal’s presentation at the Sept. 20 Spain Section meeting.

**DOES YOUR SECTION HAVE NEWS TO SHARE?** See below for complete instructions for how to submit news and photos from your Section’s happenings to be included in the AACE® International Bulletin.
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Maturity Assessment for Engineering Deliverables
FIRST PRESENTED AT THE 2018 CONFERENCE AND EXPO AS EST.2833
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