CERTIFICATION CORNER
YOU WAITED LONG ENOUGH — IT’S TIME TO GET CERTIFIED!

PRESIDENT’S MESSAGE
ETHICS AND AACE INTERNATIONAL

THE AACE INTERNATIONAL BULLETIN
SECTION NEWS FROM AROUND THE WORLD

BONUS CONTENT - TECHNICAL ARTICLE
AN OWNER’S APPROACH TO COST ESTIMATING AND QUANTITATIVE RISK ANALYSIS
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Ray Dalio is the founder, chair and co-chief investment officer of Bridgewater Associates, a global leader in institutional portfolio management and the largest hedge fund in the world.

Outside the Box will be a standing column. The views and opinions expressed are those of the authors and do not necessarily reflect the official policy or position of AACE International. We invite Source to readers to send suggestions on other potential TED Talks for publication to editor@aacei.org.
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Ethical behavior and conduct are what distinguish AACE International’s members and certificants from others that we interact with. The increasing global reach of AACE has given rise to even higher expectations that we will be leaders in ethical behavior and standards.

AACE’s Cannons of Ethics provides a platform to guide our members, certificants, stakeholders, and affiliated participants in an effort to ensure that all who we interface with have confidence and trust in us. Perhaps the larger charge is that those who we come into contact with have the expectation of consistent values and standards from anyone representing and affiliated with AACE. More simply, AACE’s members are expected to be leaders in developing and sustaining ethical relationships through individual professionalism and ethical behavior. Ethical dilemmas arrive in all forms, and can be found in corporate conduct, rights and obligations, conflicts of interest, lack of professionalism, mentoring confidentiality, corruption, bribery, fraud, whistle-blowing, communications with associates and the public, professional discussion forums and community platforms, social media, email, conventional correspondence, and attributions when writing technical papers and articles. Lapses in ethical conduct can have direct and indirect destructive and disastrous consequences, even if unintentional. The breadth of impact of which is not limited to just the individual(s) directly involved. It has the potential to reach deeply into our Association and relationships.

As a predominantly volunteer association, with a broadening global membership, anything we do as individuals or leaders at any level of our Association transcends widely varying geographical, national, political, cultural, and social boundaries. Thus, the commitment to ethics necessarily starts from the top and reaches down through all levels of the Association. While we tend to think of ethics issues and questions surrounding unethical behavior as being limited to our boards, committees, and sections’ leadership, the implications of failures in ethics can be significantly broader and extend to partners, associates, clients, and governmental agencies.

AACE’s Cannons of Ethics was recently updated and approved by the Board of Directors in June 2016. The Cannons of Ethics is available for viewing and printing through our website. AACE also has an Ethics Committee that is responsible for the administrative management of the Cannons of Ethics, and for recommending to the Board of Directors action for resolution in response to any ethics circumstances brought to the attention of the Association. AACE’s Cannons of Ethics provides guidance on relations with the public, with employers and clients, and with other professionals, as well as standards of professional performance. By virtue of AACE International’s Constitution and Bylaws, the Cannons of Ethics applies to our participation and performance in section, regional, and international events, and all related circumstances.

If you have questions or wish to discretely address any concerns regarding ethical standards and conduct, please reach out to AACE in confidence via email at ethics@aacei.org.

If you would like to contact our current president with questions or comments about The President’s Message please address your email to president@aacei.org. To engage in other discussions, check out AACE International’s Online Forums at web.aacei.org.
There have been numerous articles on the advantages of obtaining your professional certification from AACE International. A quick Google search for reasons to get certified will render many varying answers; our experience reveals getting certified:

- Grants your professional credentials by providing an impartial endorsement of your knowledge and expertise.
- Shows your professional commitment and ability to perform to your peers, supervisors, and clients.
- Results in greater recognition from peers for taking that extra step in your professional development.
- Enhances your professional image by developing certified professionals who stand out as examples of excellence.
- Reflects your personal achievement of proving excellence in your field and meeting industry standards and requirements.
- Can improve career opportunities by giving you the “edge” when being considered for a promotion or other opportunities.
- May provide for greater earnings potential through salary and wage increases based on your certification status.
- Improves your skills and knowledge through training, study, and “keeping up” with the industry via the recertification requirements.
- Prepares you for greater on-the-job responsibilities by proving that you have invested in your own professional development.
- Enriches self-esteem by allowing you to distinguish yourself beyond your job title or academic degree.

What’s In It for Me?
Let’s look at the advantages and benefits of being certified, from your point of view. It has been well documented achieving professional certification increases your salary. Numerous surveys and studies have confirmed this, and it just makes obvious sense (cents). Certification shows you have mastered the basics and are ready to go to the next step.

Now a Personal Story—After a few years of working for major engineering/construction companies, I had an opportunity to work for a large consulting firm. After I was hired and sent out on assignment, I was delighted to learn one of the bonus milestones was to achieve certification and achieving certification would earn a hefty bonus from the company for the individual. (Unfortunately for me, it was not retroactive, since I was already certified).

The company wanted to organize review classes for its employees, teaching the basics and preparing the employees for the certification exams. I was pleased to help teach a few of these classes and worked with the candidates as they studied to prepare themselves for certification. This entire process was a very rewarding experience for me. As I distinctly remember, most of the candidates did achieve their goal and passed their exam, becoming certified. This Certification Corner article is a reprint of a 2014 article, with minor edits and additional updates.

F. Sam Griggs, CCP
was a major personal and professional achievement for the candidates and accordingly, their paychecks increased.

Another Advantage—There is a lot of competition in the marketplace and certification can be a differential tool to set you apart from that competition. Wouldn’t most young professionals want a tool that can separate them from the competition—sounds like a winning situation to me? We all realize there are still a lot of good project controls professionals who are not certified, or who do not yet belong to a professional organization like AACE International. Some people are not joiners and others claim not to have the time for extra activities outside of their family or work. However, in my experience, when it comes down to the nitty gritty, a certification can often make a difference between getting hired or not. By becoming certified, you have “gone through the trenches” and become knowledgeable of the areas required by AACE International for certification. As an example, for the Certified Cost Professional (CCP) certification, you will show proficiency in various areas, not only in the cost management skills and knowledge, but also in the knowledge areas of economic analysis, project management and cost estimating and control. Certification is a “badge” proving you have gained proficiency in your field of expertise.

One of the many benefits of professional certification is the fact you now have an incentive for continuous learning. Continuing to learn is actually a good thing, a win-win situation. You are encouraged to attend seminars, workshops, and conferences to obtain Continuing Education Units (CEU); also known as Professional Development Hours (PDH), for re-certification. Yes, to borrow a phrase from college basketball that is currently in vogue, certification is not just a ‘one and done’ situation. It requires re-certification every three years. Re-certification requires you to keep abreast of new developments and new tools. Get certified and you are now eligible and incentivized to be a “continuous learner.”

A great way to attain recertification CEUs/PDHs is to attend the AACE seminars and Annual Meetings. Being a member of AACE means you have access to a large number of professional resources like Recommended Practices (RPs), Professional Practices Guides (PPGs), and the virtual library consisting of numerous technical articles, etc.,—the list is long.

I have found many companies are more likely to send employees who are certified to these seminars and Annual Meeting events. When I was a much younger and just starting out in the field, I was very interested when my project controls manager told us about the upcoming AACE Annual Meeting. It was scheduled to be in an ideal location that I had always wanted to visit. When I was informed they only sent those who were certified, I made the vow for the upcoming year—to become certified! In later years, I also found this to be true as well—Many companies will send their certified members to the meetings. Last year (2016) the AACE Annual Meeting was in Toronto and this year (2017) it was in Orlando. It is great to visit cities like Toronto and Orlando. After the seminars and presentations are completed for the day, there is always time to see the sights and taste the local cuisine.

Another benefit of obtaining certification is it helps you prepare for the future! Coincidently, I had the opportunity of attending a meeting where the speaker’s presentation focused on the last 30 years of construction projects and the challenges of future projects. He noted over the past 30 years, the largest difficulties faced by projects were budget over-runs, slippage of schedule, scope creep, and unexpected changes. During this time, the industry has added numerous technological advances, some of which were supposed to be “cure-alls” for ailing projects (aka, EXCEL, WORD, SAP, Enterprise programs, advanced scheduling software). And yet, now 30 years later, what are the results? Regrettably, the same—still have budget over-runs, slippage of schedule, scope creep, and unexpected changes. All of those technical changes and yet we still face the same challenges! The speaker’s pointed out the biggest challenge was and will continue to be complexity and extreme rate of changes. In other words, companies need people who can adapt to these extreme changes and the new technology. The question is asked: Who can respond to these challenges? The most equipped people to face the challenges of the future are those who are certified, not only do they have the required skills and knowledge to work through the challenges, but they are also continuous learners who stay in tune with the best practices of the industry.

So, we summarize some of the advantages and benefits for you to get certified? Let’s see, more money, more recognition, a chance to travel to exciting locations to participate in great conferences and seminars, and to continually learn and enhance your professional development and perhaps most important, you will be better equipped to face the challenges of the future and be part of the solution of the future.

WOW—sounds like a winner—Why wait? Let’s start now! To learn more about certification—or to get started—visit our website by clicking here.
Tingting Cheng was born and raised in Nanjing, China. Nanjing is an important city in Chinese history and culture. Nanjing has served as the capital of various dynasties, kingdoms, and republican governments dating from the third century to 1949. The city is located in the heartland of the lower Yangtze River region and the inner city area of Nanjing is enclosed by the city wall which was designed by Emperor Zhu Yuanzhang after he founded the Ming Dynasty.

Tingting is grateful to her mother’s dedication while learning and practicing calligraphy. Tingting believes that calligraphy, which she practices since age of 6, has helped her with cultivating the virtue of patience and tolerance.

Tingting’s high school studies were at the Nanjing Foreign Language School, she then moved to Beijing and completed her undergrad program at the Beijing Language and Culture University. Tingting graduated with a Bachelor of Arts in English Language and Literature. Tingting was offered a teaching position after graduation, but she decided to pursue post-secondary education overseas. She selected Brock University in St. Catharines, Ontario, Canada, and completed her MBA in 2009. In December 2015, Tingting received PMP certification.

Upon graduation from her MBA, Tingting chose to move to Fort McMurray, Alberta, to gain field experience. She worked from 2010 to 2013 at the Suncor operating plant. She worked closely with the construction team on multiple oil sands capital projects. She had the opportunity to walk around construction sites with field

“Tingting says that AACE International seminars and dinner meetings have provided her with a platform not only to refine professional knowledge and skills, but also to build a professional network and to stay connected to other professionals in project controls across the industry. AACE International brought together people with different backgrounds and work experiences, who then brought in different viewpoints and perspectives.”
“Success is not a final destination, rather, it can be any small progress made along the way that brings one closer to the state of inner fulfillment and self-actualization. Success can take many different forms, but in the core, it is a continuous effort of discovering who we are and following what motivate us.”

Tingting enjoys project controls because it requires a balance of skillsets in many aspects, such as, project management, data analysis, logical thinking, problem solving, cross-functional coordination and communication. Tingting says that through professional advancement in project controls, she can gain exposure to various disciplines and functions, and become well-rounded. What attracts her the most is the “balance” and “integration” characteristics of project controls, and as she puts it, to some extent it is a combination of science and art.

Tingting is thankful to many project controls professionals that have crossed her path and have helped her grow professionally at different stages of her career.

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Inspired by technical dinner meetings at the Section level, Tingting started a similar initiative at her workplace to organize monthly Lunch and Learn sessions Using company internal resources. Initially, the Lunch & Learns were intended for knowledge sharing within the project controls team only, but soon became popular and it was extended to other functions and business units with increasing interest from many leaders and employees.

Tingting encourages everyone to actively participate in AACE seminars and technical dinner meetings; her message is to take advantage of the various opportunities provided by AACE that facilitates professional development and networking.

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Regis Fox was born in Washington, DC, and grew up in the suburbs of Bethesda, Maryland. One summer, his neighbor asked him to help with some administrative work at his architecture studio. At first, Regis answered email and phones, then he began filing submittals and Requests For Information, and ended the summer marking up drawing revisions and participating in site visits. This experience got him hooked on the construction industry, and it set the path for the rest of his career. He initially thought he wanted to be an architect, until he toured the University of Maryland’s School of Architecture and was reminded artistic ability was not his strength. Regis excelled at problem solving and math, so he switched his major, and graduated with a Civil Engineering bachelor’s degree with a focus in project management and transportation from the University of Maryland.

After graduation, he was offered a job with a construction consulting firm, Aegis Project Controls, although at the time he did not understand how an entire company could be based on project scheduling.

His first project was a part of a five person scheduling team for the general contractor joint venture of the National Geospatial Intelligence Agency. The project was a $1.6 billion and 2.2 million square foot secure office building that also included miles of infrastructure improvements across 130 acres at Fort Belvoir, VA. It was an Army Corps of Engineering project that required a cost loaded 40,000-activity schedule, bi-monthly updates that were the basis for the payment applications, and Time Impact Analyses (TIA) for any change to the schedule. His next project was the Utah Data Center, a $1.2 Bn US-ASCE project that required a cost loaded 13,000 activity schedule. In his tenure with Aegis, he also worked on hospitals for the Veterans Administration, Army labs where they held BSL 4 pathogens, a microchip facility for Intel, and one of his favorites to visit, a Klondike Ice Cream bar factory, which was being converted from a Slim Fast milkshake plant. He also supported their claims practice, preparing Windows analyses and TIAs for their clients.

In 2014, Regis was offered an opportunity from McKissack & McKissack to develop their project controls department into a standalone business unit across the country, and to help them manage the schedule of the new MGM National Harbor Casino and Resort project. The project had a total cost of $1.4 billion and comprised of a 135,000 sqft. of gaming space, a 22-story hotel, grand ballroom and meeting spaces, 150,000 sqft. employee back of house, a 4,800-car parking garage, a 3,000-seat theater, 9 luxury food and beverage venues and 15 retail venues. As a representative for MGM he managed the contractor scheduling team that built a cost loaded 36,000-activity schedule. They completed construction in two and half years, and now it is Maryland’s top grossing casino.

As director of project controls, he organized their project controls professionals across the country to provide standalone consulting services for owners, contractors, and subcontractors. He developed standard procedures and expectations...
for all new projects, and worked with existing teams to implement best practices where possible. He provided direct support on a variety of projects and programs including the $1.2 Bn Baltimore City Schools 21st Century School Modernization Program, higher education facilities, mixed-use developments, and for the Metropolitan Washington Airports Authority Engineering & Construction Department.

In July 2017, Regis joined Clark Construction as Director of Enterprise Scheduling. His task will be to lead the scheduling team and enterprise schedule management and analysis. He is excited about this next stage of his career and the experience in supporting one of the top contractors in the country. He is a certified Planning and Scheduling Professional from AACE International, and has an expired PMI-SP certification.

Regis enjoys project controls because it provides the tangible elements of project management and application of tested science to improve the probability of success. You are required to know a little about a lot, and must derive answers from available information. You get to work and communicate with a variety of people from workers and superintendents on the ground, up to executives in the board room.

He keeps coming back because each new project comes with both a similar and unique set of challenges to overcome using past solutions and innovating creative new approaches to solve the current problem and carry the experience to future endeavors. You must recognize that you are a part of something bigger, and no matter how important you think a schedule or policy or procedure is, you must be flexible when dealing with others, so that what you are doing is the best for the team.

Regis thinks that the technical content produced by AACE International is second to none. He uses the Recommended Practices (RPs) for guidance and training. If he ever gets into a situation where he is questioning his judgement, he will re-read an RP to re-confirm that he does have some idea of what he is talking about and an industry panel of experts will back him up. He went to his first regional AACE International event at the 2016 Northeast Symposium and then went to Toronto for the Annual Meeting. Up until these events, his work experience had been with smaller firms, and while he supported large projects, there were typically only a handful of people who he interacted with on a regular basis. He mentioned the calming feeling he experienced at the 2016 Northeast Symposium after the first few presentations and networking sessions, when he realized he was not alone with his enthusiasm for the profession. He enjoyed networking with people that could help hone his skills, and develop a network to offer real world business success for him and his firm. These same feelings were exponentially replicated in Toronto at the Annual Meeting.

He enjoys the technical presentations as he always looks for the practical applications and real world demonstrations of what people have done and how he can potentially apply to his projects. The Annual Meeting gave him an opportunity to engage with other Section presidents, to compare notes of what worked and what did not work, so that he could bring some of these lessons back to his section. The focused workshops about improving section management were invaluable, and he would not have that opportunity to do those but at the Annual Meeting.

He joined the board of the National Capital Section in 2015, and he is currently entering his second year as President of the Section. Being responsible for one of the largest sections of AACE International, he has experienced challenges that he did not know existed, but also opportunities to bring his local membership closer, and to benefit from their mutual appreciation of all things AACE. In his first year as president, his goal was to provide a recognizable value to his membership. Their members were not taking advantage of what was being provided and while they had over 250 members, their average attendance at section meetings was only 12. He worked with his Board to produce better, engaging content for his members, such as round table discussions, site tours, and panel discussions with leaders in the industry to avoid the dreaded “death by PowerPoint” that can occur during the presentation of technical content.

He has also tried to bring his section into the 21st Century by creating a brand new modern website (www.aacei-ncs.org) and using available technology and online services to better communicate and engage with their members. They have invested in a webinar platform that allows them to stream their meetings all across the globe. They can track email distributions and perform analytics to identify when the best time is to get the most event registrations. All of their event registrations flow through one system that can take online payments, process refunds and even print out nametags. These are just some of the changes they have made to streamline the behind the scenes work for him and his board and to deliver a better experience to their membership.

He is proud to say that results of these efforts are displayed in their average in-person meeting attendance in 2016/2017, which has doubled since the previous year, in addition to the average 20 people who register and view their meetings through their webinar platform. These results helped earn a Platinum Award for the National Capital Section in 2017. He is excited to continue his success into 2018 and build on these numbers.

As the National Capital Section President, Regis sends out communications half a dozen times a month to his database of over 400 people. Since part of his job function was to network and identify new opportunities for his company, it is a helpful icebreaker to discuss AACE and his role in the region, and it also gives him some authority when talking about project controls to those who might not be as educated in what we do.

Nationally, he is engaging with leaders in the industry, and building a network so that if he finds himself in a random major metropolitan area, he can usually find a connection through AACE. He is a planner at heart. His leadership role at AACE has given him an opportunity to plan events about planning. It is a productive distraction from his job in planning, and can be an escape the truly stressful task of planning his upcoming wedding.

Regis has found success in his career by not trying to act like the smartest person in the room. He says ‘arrogance can be abundant in project meetings and recommends not to tell people why they should listen to you. Just let your work speak for itself and refuse accept the status quo’. He also recommends constantly trying to improve himself or whatever process he may be working on at the moment. He advises ‘spending time not only solving a problem, but how to optimize its solution, so that you can be more effective through the life cycle of a project, and focus on the next challenge, the next project, or the next client.’

SOURCE OCTOBER 2017
An Owner’s Approach to Cost Estimating and Quantitative Risk Analysis

James Thomas Wolf, CCP and John Wallace Blodgett

Abstract: This article will present an owners’ approach, from a major utility industry perspective, to applying cost estimating standards and quantitative risk analysis to major projects. In the area of cost estimating, the authors’ will provide a model for using AACE International Recommended Practices to develop enterprise standards to shepherd major project investments through the Plan, Do, Check, Act (PDCA) cycle. In the area of quantitative risk analysis, the article will explore a variety of approaches for owners to use stochastic modeling and simulation to perform integrated cost and schedule risk analysis. Modeling examples will include the use of historical project data, scope quantification, and facilitated workshops to predict project outcomes throughout the project lifecycle. Business applications include estimate validation and contingency determination for major projects. This article was first presented at the 2016 AACE Annual Meeting as OWN.2210.

Much has been written about the research of Dr. Bent Flyvbjerg and others about the tendency to underestimate costs on large public transportation and infrastructure projects. This underestimation, at best has been called out as an indicator of a lack of best-practices and skill on the part of the project owners, and at worst, outright deception on the part of the project proponents to their decision makers. How best do owners provide internal governance over this tendency, and how do they best provide their decision-making board with the best possible information to make an informed decision, while ensuring that capital is not wasted? This article will present an owners’ approach to applying a cost estimating standard to its major projects. In the area of cost estimating, the author will provide a model for using AACE International Recommended Practices to develop enterprise standards to shepherd major project investments through the decision-making cycle. The specific requirements in such a standard will be discussed. The net-result is a reasonable and practical method for contingency determination for major projects.

Dr. Bent Flyvbjerg’s notable research indicates that in 9 out of 10 transportation infrastructure projects, costs are underestimated, and that project overruns averaged 28 percent across the board [6]. Dr. Flyvbjerg raised a great deal of controversy in theorizing that lying, or cognitive internal deception on the part of project proponents, is a major factor in project overruns in public projects. In private industry, the statistics are not usually disclosed, but it is believed that similar practices occur with similar results. In the authors’ experience, the concern with project governance or sanctioning boards is focused on the number of times the project returns to them for reauthorization because the project was forecasted to overrun its initially authorized costs. Anecdotally, in the authors’ experience, this has occurred on 40-60 percent of projects observed. The sense on the part of management is that if, in fact, the sanctioning board is approving projects at a P90 confidence level, then only 10 percent of the projects should return for reauthorization. Conversely, as John Hollmann indicated in a 2012 article, “Estimate Accuracy: Dealing With Reality,” published in the Cost Engineering journal, Hollman indicated, “tight accuracy may indicate wasted capital funds” [7].

Project governance organizations help develop the internal business cases that provide the executive governance board with the scope, schedule, costs, risks, and appropriate contingency in which to make a sanctioning decision.
On one hand, the cost estimate must represent a proper accounting of all the elements of scope, as well as an assessment and estimate of the known risks, estimate uncertainty, and an accommodation for unknown-unknowns. These unknown costs tend to have a higher range at the early stages of a project, with very little scope definition. On the other hand, if an executive board authorizes funding for a project cost estimate that is twice as high as the engineer’s current point estimate, how do they ensure this extra funding does not become a proverbial blank check? The challenge, then for private owners, is how to give their project executive boards an honest answer. The challenge, then for private owners, is how to give their project executive boards an honest answer.

**An Owner Cost Estimating Standard**

Owners typically have internal project governance processes and guidance documents. These documents take the form of policies, standards, procedures, and guidelines. Standards are the governing documents, upon which an auditor may monitor compliance with company requirements. A standard represents “what” is required, while a procedure describes “how to” perform the requirements.

In the area of cost estimating and contingency, the solution to the problem of underestimating may be for the owner to standardize a conservative approach to developing cost estimates and contingency. The estimating of contingency is a subject upon which much has been written, yet there is little consensus as to what is best-practice. John Hollmann explains that the “lack of consensus and the unfortunate political nature of contingency issues partly explains why AACE International has never established a recommended practice for how to estimate contingency” [8]. Owner cost estimating standards can therefore be developed to fit the owner’s internal culture, requirements, and expectations. The requirements detailed in such a standard can help ensure the development and updates of project cost estimates with reasonable estimate certainty and contingency determination.

An owner cost estimating standard should provide requirements adapted from the AACE Recommended Practices for applying the general principles of estimate classification to project cost estimates. According to AACE International Recommended Practice No. 18R-97, “the cost estimate classification system maps the stages of cost estimating together with project scope definition maturity, estimating methodology, and acts as a guideline for estimate accuracy” [1]. Owners may use the AACE Cost Estimate Classification Model to inform internal decision-makers or a sanctioning board, how to interpret the accuracy of the estimate based on the maturity of the project design deliverables, as well as the estimating methodology used. The cost estimating standard provides requirements to project teams to prepare and document the basis of their cost estimate. The intent of such a standard would be to improve understanding among all of the stakeholders involved in preparing, evaluating, and approving project cost estimates. The AACE Cost Estimate Classification Model indicates a generally accepted accuracy range of a project estimate based upon project definition [1].

Within an owner cost estimating standard, the various areas of the business must develop their own procedures, criteria, and associated checklists, for evaluating and classifying cost estimates for common categories of work. The specific criteria should be based on the category of work. For example, the project deliverables for a Class 3 estimate will be substantially different for an environmental remediation project than for an information technology project. Both of those types or projects, as well as capital construction projects are common in large owner organizations.

**Estimate Classification**

The following section is take largely from the AACE Recommended Practices, and is included to describe how an owner may apply the AACE Cost Estimate Classification System to its own internal processes. Figure 1 shows how the Cost Estimating Classification System can be used in the owner’s standard, along with general guidelines for how each estimate is used in each class of estimate.

According to AACE International Recommended Practice 18R-97, Class 5 project estimates correspond to projects in the early planning phase before a project team has been assigned. This is a time when the level of project definition is very low (e.g., very high-level requirements), so the corresponding estimates have a wide range of potential outcomes [1]. Estimate basis assumptions should always be documented in order to explain variances, should future estimates be significantly higher or lower. Class 5 estimates may be used for Advanced Authorization (AA) and for forecasting.

![Figure 1 – Estimate Classification](image-url)
future (i.e., unauthorized) gates. Additional applications may include portfolio planning and preliminary project prioritization. They should never be used for full project authorization. Class 5 estimates use stochastic estimating methods such as cost/capacity curves and factors, historical records and other parametric and modeling techniques. The expected accuracy range for Class 5 estimates is +100 percent to -50 percent.

Class 4 estimates are prepared with more information than Class 5 but still with limited project details. Like Class 5, Class 4 estimates subsequently also have a fairly wide range of potential outcomes. Class 4 estimates can be used for project screening, determination of feasibility and concept evaluation. An owner should have preliminary engineering up to 30 percent design review at this point. Class 4 estimates may be used for full project authorization only by exception. In most cases, however, an estimate of this class will be used for partial authorization. For example, when major projects are gated, meaning that they must return to the executive committee to obtain authorization for a subsequent phase, a Class 4 estimate may be used for the initial gate being authorized or for future, unauthorized gates. According to RP 18R-97, “Class 4 estimates generally use factored estimating methods such as equipment factors, Lang factors..., gross unit costs/ratios, and other parametric and modeling techniques” [1]. For areas of the project where detailed project information exists, deterministic estimating methods should be used. The expected accuracy range for a Class 4 estimate is +50 percent to -30 percent.

Ideally, owners will use Class 3 estimates for full project authorization or approval of later gates, unless an exception has been granted by its project governance group. Even if gated projects use a Class 4 estimate for an initial gate, as described above, a Class 3 estimate should be the minimum requirement for any subsequent gates. Estimates at this stage should rely on a combination of deterministic and stochastic estimating methods [1]. The estimate should be based on scope of work documents as well as expected permit costs. Permit costs and conditions of permit approval alone can add a great deal of uncertainty around the Class 3 estimate. An example of this is the final routing of a transmission line, which may not be known until final permits are received, which is usually fairly late in the design phase. A major change in the routing would likely be considered a “black swan” event which would not be accounted for within AACE cost estimate uncertainty. Owners would treat these events as new projects. The expected accuracy range for a Class 3 estimate is +30 percent to -20 percent.

Class 2 estimates are generally prepared to form a final detailed control baseline against which all project work is monitored in terms of cost and progress control. At this point, owners will have engineering and design at 100 percent complete. Class 2 estimates are highly detailed and time consuming to create. As a result, owners may rely on contractor bids to create Class 2 estimates. If the Class 2 estimate is significantly higher than the Class 3 estimate used for authorization, a reauthorization or final gate approval may be required. Permits are typically secured at this phase. Class 2 estimates are to be used for reauthorization requests and will form an updated control baseline prior to construction starting. For gated projects, a Class 2 estimate is to be used for the final gates of the project. Expected accuracy range for a Class 2 estimate is +20 percent to -15 percent [1].

According to RP 18R-97, “Class 1 estimates are generally prepared for discrete parts or sections of the total project rather than generating this level of detail for the entire project” [1]. Owners will almost never use a Class 1 estimate internally because of the effort involved in creating them. However, a Class 1 estimate may be used when reforecasting the Estimate at Completion (EAC) for a project which is underway or Class 1 estimates will be prepared by contractors when requesting change orders. In cases where construction is already underway, a Class 1 estimate may be based on earned value management metrics and performance trending analysis. Expected accuracy range for a Class 1 estimate is +10 percent to -5 percent.

### Basis of Estimate

A second key requirement for an owner cost estimating standard is, regardless of class level, to include a documented Basis of Estimate (BOE). According to AACE International Recommended Practice No. 34R-05, the BOE defines the scope of the project, and ultimately becomes the basis for variance analysis and change management [2].

The BOE identifies the Basis of Design as well as the types and status of engineering and design deliverables that were provided to prepare the estimate including any design basis assumptions. These design basis assumptions can include line of business specific design deliverables checklists, and listings of all engineering drawings.

Additional elements of project definition should also be documented. These deliverables may include permits, contracts, procurement of long-lead items, and field reconnaissance. Such deliverables, once in place, can greatly increase the level of project definition, thus decreasing the estimate uncertainty. Outstanding deliverables and their associated risk and uncertainty should be documented.

Finally, the estimator should identify the specific cost basis in the BOE document. According to AACE International Recommended Practice No. 34R-05, a cost basis should include the following:

- The pricing source for all labor hours, and all labor productivity adjustments. Provide appropriate detail if productivities vary by trade and/or location within the project (plant, etc.).
- All wage rates used (including crew/craft rates, craft mix, etc.). Identify all items included in all-in rates (if used).
- Pricing source and methodology for construction indirects.
- Pricing source for all start-up costs.
- Pricing source and methodology for all home office costs (project management, engineering, design, etc.).
- Document the basis for any contractor fee costs.
• Pricing source and methodology for costs such as freight, taxes, duties, etc.
• Pricing source for any owner’s costs included in the estimate.
• Currency exchange rates if applicable, as well as the stability and/or volatility of rates.
• Escalation indices used, and the method of calculation (including duration).
• Contingency development and basis.
• Location factors used and the basis for these factors.
• Influence of local market conditions.
• Capital costs vs. expense costs, or other categorization as necessary.
• Any other pricing factors or external influences that may have a significant impact on project cost should be identified [2].
• Quantitative Risk Analysis methodology, including inputs, confidence intervals, and percentiles used for authorization and contingency.

A Cost Basis forms the documentation of all the methods and sources used in determining the estimate, and must be retained for forensics, variance analysis, and lessons learned later in the project [2]. The owner’s cost estimating standard should require each line of business to define the BOE requirements for each class of estimate. The BOE requirements shall specify the project definition deliverables which define a class of estimate, including those related to engineering, planning, procurement, and permitting.

Independent Third Party Reviews
Peer and third party review of draft and final estimates is a common industry practice to assess the quality of estimates and place an independent validation on estimates. An owner’s cost estimating standard may require a peer or third party review process at both the mid-point of estimate development, as well as prior to submitting the final estimate. For all projects above a certain dollar threshold, or those without experienced internal estimating resources, owners may consider requiring consultation of a third party estimating expert. Third-party assistance should also be considered for projects with unique characteristics, highly complex or critical projects (such as environmental issues), or projects where there is minimal internal experience and/or historical data. Owners may also require third-party estimating for enterprise wide projects, or those spanning multiple lines of business, to help ensure the full scope is estimated and to validate internal estimates.

Internal Controls Over Contingency
Adopting the AACE uncertainty factors as part of the owner’s authorized project contingency can be highly controversial because executive approvers fear that higher contingency amounts will most surely be spent. The owner must therefore provide adequate internal controls over the release of contingencies in order to ensure that there is no misinterpretation on the part of project teams of having a blank check. Projects may be sanctioned or authorized at a P50, which implies some contingency and uncertainty is built into the expected case. This contingency is expected to be spent, and is included in the project and portfolio budget funding. The project team may spend this amount without seeking additional approvals, but must provide an accounting of its use in monthly reporting. This is a prudent approach for owners because the expectation is that 50 percent of the projects will underrun their budgets, which will provide funding for the 50 percent of projects that are expected to overrun their budgets. Not accounting for this level of contingency means that projects will be deferred in order to create available funding for other projects that inevitably overrun. This churn in the portfolio almost certainly leads to higher costs overall as a result of mobilization, demobilization, and escalation of deferred projects.

As a further level of contingency, an owner may sanction or authorize at the P80 or P90 level, or may simply add 30-50 percent contingency on an estimate including the expected value of project risks, depending on its class. Because a Class 5 should never be used for authorization, it would not be expected to see an authorization with 100 percent contingency, but an owner could add 30 percent or 50 percent contingency depending on whether they were at Class 3 or 4, respectively. This conservative approach to contingency requires rigorous internal controls and does not belong to the project to spend. The sanctioning board will authorize the project with this contingency included, but the approval to release the contingency for the project’s use must follow a rigorous review and approval process, ultimately resulting in approval by the Chief Financial Officer (CFO). As the ultimate controller of the company’s entire budget, the CFO must make the decision to release project contingency because the CFO must understand the internal trade-offs being made to fund this contingency use. The sanctioning board does not have to reauthorize the project, but can be comfortable in knowing that they are approving an estimate that represents an economically sound, reasonably possible worst-case scenario with adequate internal controls against the use of contingency.

A challenge to authorizing a project at Class 3 or 2 is the amount of sunk costs it takes to get to that level of project definition. The board may be risk-averse to spending this amount of money with the risk that the project is killed and the capital has to be reclassified as expense. In addition, waiting to fully authorize at Class 3 could limit the board’s ability to review the alternatives analysis and make a choice between several options. While these challenges must be overcome with internal controls, the estimating standard will stand is the owner’s documentation of the different estimate classification levels. The proper use of quantitative risk analysis will help determine these estimate levels.

Quantitative Risk Analysis
Quantitative project risk analysis is the process of using stochastic modeling and simulation techniques to predict potential project outcomes. Within the industry, this is generally referred to as Monte Carlo simulation, which is actually only one type of simulation, but nevertheless covers the most common applications. Stochastic models live in stark contrast to deterministic models in that the latter rely on point estimates,
whereas the former view the work in ranges of potential outcomes. This distinction is important if an organization wants to know the probability of coming in under budget, of achieving certain milestones, or of incurring catastrophic overruns, just to name a few examples [3].

A distinguishing characteristic of project risk analysis is the use of network logic in an integrated cost and schedule risk model. Purely Excel based models can be useful for most purposes, but network logic is extremely cumbersome to build in Excel. This is why schedules are developed in dedicated applications, such as Primavera P6. These applications not only have the relevant tables, such as project, activity, and resource tables, but they also have the ability to associate activities using logical indicators. For the purposes of risk analysis, this is important because a delay on one activity will impact successor activities, which not only impacts future completion dates, but also resource use and cash flow in a cost and resource loaded schedule. Just as we want to see this impact in a CPM schedule, we also want to see the impact during a simulation. This is why a cost and resource loaded schedule is often the starting point for a stochastic model.

**Modeling Basics**

In developing stochastic models for a large project, the analyst will typically start with a deterministic model, such as a cost and resource loaded schedule. The analyst must then consider the model inputs, outputs, correlations, and the optimal level of detail in the model itself. The inputs to a typical cost and schedule model are as follows:

- Work, typically measured in labor hours
- Duration, typically measured in days
- Cost, typically measured in dollars per hour for a given resource

One will note that the variables above are standard inputs to a cost and resource loaded schedule. Using such a model as a starting point, the analyst must turn the deterministic variables above into stochastic variables. This is done by converting single values into probability density functions. For example, the analyst may convert an estimate of 100 hours of effort for a given activity into triangular distribution, one of the simpler and more common functions, with a minimum (i.e., best case) of 90 hours, and most likely value of 100 hours, and a maximum (i.e., worst case) of 150 hours. This deterministic estimate of 100 hours of effort is now a stochastic variable with a range of possible values.

Typical outputs include the following:

- Overall project cost
- Overall project duration
- Milestone completion dates

Note that the outputs above are also typical outputs of a cost and resource loaded schedule. Once the inputs are converted from deterministic to stochastic variables, most simulation software products only require the user to specify which outputs are to be measured. For the three variables above, the analyst wants to derive the range of possible outcomes cost and schedule outcomes. For example, if a project is only profitable below a cost of $10 million, the analyst may want to determine the probability of the overall project cost being less than that value. Similarly, if a firm will incur penalties for missing milestone dates, the analyst may want to assess the probability of completing such milestones prior to those key dates.

Correlation is a vital consideration, as inadequate correlations in a model will usually lead to an overly optimistic assessment of overall risk. Correlation in this context refers to the extent to which different input variables change together in a predictable way. For two positively correlated variables, one will likely increase when the other increases and decrease when the other decreases. For two negatively correlated variables, one will likely decrease when the other increases and vice versa. For example, a sequence of activities in the same workstream is likely to exhibit a certain amount of systematic risk, meaning that poor productivity on one activity is unlikely to occur in isolation. In this scenario, the factors that are driving poor performance on one activity, such as an inexperienced crew or poor site conditions, are likely to exist on the others as well, so a moderate positive correlation on labor hours may be advisable.

The level of detail refers to a number of potential parameters, but most importantly the following:

- The number of activities or work packages
- The number of stochastic variables

The optimal level of detail is probably the most important consideration of all for a number of reasons. First, an excessive number of activities or work packages in the model can cause a portfolio effect, where the variance in the output variables is reduced by what is effectively a highly diversified portfolio of inputs. The effect of this reduction in variance is an overly optimistic assessment of overall risk. For example, a common mistake is building a model directly on the project’s cost and resource loaded schedule. Schedules usually have thousands of activities, which is entirely too much detail to get any value from the risk analysis exercise. A better approach is to consolidate those activities into a smaller number of key work packages, still detailed enough to understand high level dependencies between work packages, but not so detailed that simulation iterations cancel each other out.

Second, the benefit of building a large and highly complex model is not usually worth the effort involved. It is important for project planning exercises of any type is to stay decision driven, meaning that additional modeling effort is only worthwhile if it informs a decision. For example, in deciding whether to pursue a project, an investor may want to look at the probability of the cost being less than the break-even point, defined here as the cost above which the project NPV turns negative. Once an analyst reaches a point where the decision will not change, any additional effort is a waste.

A useful exercise in determining the optimal level of detail is sensitivity analysis. A simple way to do this is to apply a range of plus or minus some percentage (e.g., 20 percent) to every deterministic input variable, change each input variable one at a time while
holding all others constant, and measure the impact on the output variables with each change. Each input variable can then be ranked in descending order of resulting variance on output variables. Typically, a small number of variables will account for the vast majority of potential variance. These are the variables that should be modeled with stochastic variables and potentially broken down into further detail.

**Simulation Basics**

The most commonly understood type of simulation is Monte Carlo. In this type of simulation, a random number is generated between zero and one. That number is then used to take the inverse of the cumulative distribution function for a given input variable. The result is a value, typically in units of work, time, or cost in the case of project risk analysis. This randomly generated result serves as the value for a given input variable. This process occurs simultaneously for each random variable in the model, and it is repeated for each iteration of the simulation.

The manner in which stochastic variables interact is a key consideration. In particular, cost and schedule risk models make extensive use of joint probabilities. For example, the cost of a given work package may be equal to the work multiplied the resource rate:

\[
\text{Cost} = \text{Work} \times \text{Resource Rate}
\]

In a stochastic model, \textit{work} and \textit{resource rate} are random variables. In the simulation, there will be a randomly generated value along the given probability density function for each variable. If the simulation is run with 1,000 iterations, the result will be a sample population of 1,000 observations for cost, and this population will follow a new distribution representing the joint probability of work and resource rate.

For a model with 100 work packages, the overall cost of the project will be the sum of 100 such cost values. With 1,000 iterations in the simulation, overall cost will have a sample population of 1,000 potential outcomes, each one being the sum of the randomly generated cost values for the 100 work packages below it in the work breakdown structure.

Ultimately, each output variable will have its own sample population. For example, a simple model run with 1,000 iterations will generate 1,000 observations for overall cost, overall duration, and the completion date for a key contract milestone, just to name a few potential variables.

**Determining the Best Distribution**

There are two primary methods for determining the appropriate probability density functions for a given input variable:

- distribution fitting
- expert judgment

The most reliable approach to assigning a probability density function to a given random variable is by fitting distributions to historical data [4]. Most commercial simulation applications have a distribution fitting feature. Once these distributions are derived from historical data, they can be stored as stochastic variables for future models. One approach recommended by these authors is to maintain a stochastic rate sheet, where high level resources (e.g., an offshore vessel, a crew, or a particular contractor) have stochastic resource rates (e.g., cost per day) and productivity rates (e.g., days per unit) for a given type of work (e.g., tower installation).

For example, if a project includes the installation of a number of electrical transmission towers, an analyst would want to look at past tower installations for guidance. This analyst would first want to determine whether the historical data set includes a spastically significant population. Then the analyst would want to look for key variables, such as the duration, cost, and number of towers for each of the past projects. Next, the analyst would want to normalize the results by defining key performance measures such as days per tower and cost per day. Finally, the analyst would fit distributions to the populations available for each measure. The result is a set of random variables that can be used as inputs for a future tower installation model.

A less reliable, albeit more common, approach is to leverage expert judgement [5]. A typical approach to determining distributions based on such human input is to ask for a best case, worst case, and most likely outcome for each variable. These three point estimates can be used as the parameters for a number of common distributions, including the triangular and pert (sometimes called beta pert) distributions. Although it is the most common, the authors of this article do not recommend the use of triangular distributions, most notably because the place too much density at the center of the distribution, and the tails are bound in a way that is not observed in nature. The pert distribution relies on the same three point estimate parameters and is no more difficult to use, but the shape of the curve, including infinite tails, is a much better approximation of distributions found in nature, such as the lognormal and normal distributions.

In order to ensure a degree of integrity, it is advisable to leverage the services of expert facilitators to determine three point estimates. Such professionals will use a number of techniques to derive representative distributions from experts. Such techniques include removing bias and risk identification exercises to avoid overly narrow ranges. They will also host workshops with cross functional teams, including the estimators who will determine the cost impact of certain scenarios. Perhaps most importantly, they will apply more sophisticated modeling techniques, such as converting parameters for best and worst case scenarios into more conservative P10 and P90 parameters.

**Interpreting the Results**

From an owner’s perspective, the output results from a simulation will typically be used for contingency determination and estimate validation.

For contingency determination, the key question will be the level of acceptable risk for the organization. In this context, it is useful to view the results as two distinct components: the deterministic estimate and the probability curve derived from the simulation results. First, determine the probability of the cost being less than the deterministic estimate. This will provide a percentile, sometimes referred to as a P-value, for the deterministic estimate. Then determine the target
percentile, defined here as the desired probability of spending less than the budgeted amount. The difference between the target percentile and the deterministic estimate will serve as the contingency.

Sometimes a second level of contingency may be included in the appropriations request. In such cases, the second level of contingency requires a higher level of authority to draw down for project use. For example, the first level of contingency may be consumed with the approval of a manager within a business unit, while the second level may require the approval of a corporate officer, such as the CFO.

For example, a project may have a deterministic estimate of $80 million. The results of the risk analysis may show that this is actual a P30, meaning that there is a 30 percent probability that the project will cost less than $80 million. If the organization applies a target percentile of a P50, which may be $100 million in this example, then the contingency will be the difference between the P30 and the P50, or $20 million. If the organization applies a second level of contingency up to the P90, which may be $150 million in this case, then the second level of contingency would be $50 million. In this scenario, the total appropriation for the project would be $150 million, where $80 million is to be spent at the discretion of the project manager, another $20 million can be spent at the discretion of local management, and the final $50 million requires officer approval.

For estimate validation, the key question is the probability of success based on the expected level of accuracy. This is where the organization’s estimate classification will be used. Based on the simulation results obtained above, the analyst will determine the probability of spending within the targeted accuracy range. This is referred to as the confidence level.

To continue the example above, let’s say the project is budgeted at the target percentile of P50, or $100 million. Let’s also consider that projects within this organization are expected to prepare a Class 1 estimate, defined here as a +10%/-5% estimate, for final appropriations. In this case, the analyst will want to determine the probability of falling within that range. A +10 percent estimate is $110 million, and a -5 percent estimate is $95 million, so we will use the output distribution to determine the probability of spending between $95 million and $110 million. This confidence interval will be reported to determine if the level of certainty is appropriate for the given investment.

Conclusion

This article has provided an owners’ approach, from a major utility industry perspective, to applying cost estimating standards and quantitative risk analysis to major projects. In the area of cost estimating, a model was provided for using AACE International Recommended Practices to develop enterprise standards to shepherd major project investments through the Plan, Do, Measure, Assess (PDMA) cycle. In the area of quantitative risk analysis, the article explored a variety of approaches for owners to use stochastic modeling and simulation to perform integrated cost and schedule risk analysis. Applications included the use of historical project data, scope
quantification, and facilitated workshops
to predict project outcomes throughout
the project lifecycle and support
estimate validation and contingency
determination for major projects.

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- 2018 Annual Meeting - June 24 - 27
  Manchester Grand Hyatt
  San Diego, California, USA

- 2019 Annual Meeting - June 16 - 19
  Sheraton
  New Orleans, Louisiana, USA

- 2020 Annual Meeting - June 28 - July 1
  Hilton Chicago
  Chicago, Illinois, USA
**Brazil Section**

On July 20th, the Brazil Section hosted a great event in Fortaleza, a city in the northeast of Brazil. It was the fourth regional event organized this year, the others were held in Belo Horizonte, Recife and Salvador. The professionals Marcelo Augusto, Aldo Mattos, Tito Cardoso and Alex Amarante presented high-level lectures regarding feasibility and financial efficiency in complex projects, which kept the audience entertained during the four-hour event in the University of Fortaleza (UniFor). Attendees are shown above.
**India Section**

The India Section participated in a poster presentation session at PMI’s Project Management Practitioners Conference 2017 (PMPC 2017) at Bangalore, India on July 20-22 and presented on risk analysis and contingency determination. Ms. Bhagya Nair, a volunteer of South India Section, highlighted the importance of having a quantitative approach for contingency estimation in her presentation. Every project has its inherent set of risks and while estimating the project budget, contingencies are kept to manage these uncertainties. The expected value method for contingency determination was explained as per the guidelines provided in AACE RP 44R-08 and RP 65R-11 to the participants who visited the kiosk. A demonstration of simulation analysis method on a project and contingency determination using the simulation results was shown (using SAFRAN scheduling software) to the audience. There were discussions on the analysis of results and the group deliberated on the cost and schedule drivers. The session was very interactive and the listeners found it informative. The conference was attended by project management practitioners from across industries and the importance of contingency estimation in all fields ranging from R&D to production industries was highlighted. Ms. Bhagya also gave an overview of other contingency estimation methods available such as parametric modelling, predetermined guidelines, expert judgement etc. Shown above Ms. Bhagya S Nair, a project controls representative, presented at the Bangalore, India conference.

**Turkey Section**

The Turkey Section was chartered on 10 June 2017 during the Annual Meeting in Orlando, Florida. The section currently has six members and the section officers are preparing documents to officially register the Turkish Section within Turkey. The section’s first president is Abdullah Akpinar, EVP PSP. He has been an AACE member since 2012. The Turkish Section recently activated its website (www.aaceturkey.com) and other social media accounts.

To create awareness of AACE International and its certifications, memberships, and training programs, section officers are targeting public and private enterprises, as well as the public at large in Turkey. They hope these efforts will also increase the number of AACE members. The section also plans to reach various enterprises such as construction companies, specialist contractors working on government buildings, commercial buildings, industrial facilities, healthcare facilities, higher education institutions, hospitality, power generation and transmission, utilities, infrastructure, and the oil and gas industry.

The Turkish Section is also initiating efforts to reach professional associations, universities, and consultancy firms in Turkey for the same purposes. They are aiming to visit these entities to present what AACE International is, and how AACE can be of help to these entities.
HOW TO SUBMIT SECTION NEWS TO THE AACE INTERNATIONAL BULLETIN

When Will Your Section News Submission Be Published?

The digital Source magazine includes all “Section News” submissions. Source has a submission deadline of two months in advance of the issue date. Please review the following production schedule. It lists the submission periods for the six bimonthly issues of Source magazine in 2017.

2017-2018 Source Section News Submission Schedule

February 2017
- Items submitted from Oct. 16 - Dec. 15, 2016
April 2017
- Items submitted from Dec. 16 - Feb. 15, 2017
June 2017
- Items submitted from Feb. 16 - April 15, 2017
August 2017
- Items submitted April 16 - June 15, 2017
October 2017
- Items submitted June 16 - Aug. 15, 2017
December 2017
- Items submitted Aug. 16 - Oct. 15, 2017

February 2018
- Items submitted from Oct. 16 - Dec. 15, 2017
April 2018
- Items submitted from Dec. 16 - Feb. 15, 2018
June 2018
- Items submitted from Feb. 17 - April 15, 2018

This production schedule is based upon production schedules at AACE headquarters, as well as our printer having two to three weeks production time to take our in-house files and convert them to the Nxtbook software for posting. Enhanced features like audio, video, website links, and more will be a part of each issue of the Source. Some technology features will require additional production time and earlier deadlines. The magazine is to be ready for posting by the first of the month.

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.

How to Submit Text and Photos

Please submit any and all text as a part of the e-mail or as a Microsoft Word file attachment. Please submit any photo or photos as individual attachments in tiff or 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). We can convert large 72 dpi submissions into the required 300 dpi. This process shrinks the size of the original submission. We cannot use photos taken on cell phones. For photos to be published, they must be in focus, of print quality, and wide enough to fill the width of the column layout.

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. Do not list the Section officer first unless he or she is photographed on the left with guest speakers on the right.

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. Never refer to the Section as a chapter.

Contact AACE Concerning Missing Submissions

Generally, all submissions received in the above scheduled times will be published in the listed issue. Items are not held because of space restrictions. There is no waiting list and no preference is given to one Section over another. 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.

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.

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.

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.)
We want to hear what AACE International means to YOU!

Submit your ‘I Am AACE’ 45-60 second video for a chance to attend the 2018 Annual Meeting for FREE.

AACE International is looking for creative and inspiring video submissions to let industry professionals know the benefit of joining AACE International and attending the Annual Meeting. Find more information about the ‘I Am AACE’ video contest at web.aacei.org.

Deadline extended to October 15th.

Region 5 Symposium is Back by Popular Demand!

The regional section leadership and event planning team is proud to announce the 2nd Annual AACE International Region 5 Symposium to be held in The Woodlands from November 3-4, 2017.

Our team is actively planning this year’s event which will include technical presentations from a variety of industry sectors and perspectives as well as an Owner Panel discussion. In addition to a fantastic technical program, there will be opportunities to network with other project professionals.

We would encourage you to visit the website at www.region5symposium.com to find additional information and register for the event. If you have an interest in presenting at or sponsoring the 2017 AACE Region 5 Symposium you are encouraged to email info.aaceregion5@gmail.com.

We look forward to seeing you at this year’s event!

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**OCTOBER 2017**

**8-10** CMAA National Conference and Trade Show, The Southern California Chapter of the Construction Management Association of America (CMAA), Washington, DC
Contact: www.cmaasc.org

**8-12** Development Geology Training Course, Dubai, UAE
Contact: training@mogltrainingnewsletter.com

**18** CMAA Seminar: Progressive Design-Build The Owner’s Perspective, Long Beach Airport Marriott, Long Beach, CA
Contact: www.cmaasc.org

**19** Disaster Conference, Chicago, IL
Contact: www.disasterconferences.org

**19** CMAA Legal Seminar: Alternate Project Delivery Under California Law Where Are We Headed, The Southern California Chapter of the Construction Management Association of America (CMAA), Long Beach Airport Marriott, Long Beach, CA
Contact: www.cmaasc.org

**19-22** American Society of Plumbing Engineers Technical Symposium, Hotel Bonaventure, Montreal, Quebec
Contact: 2017tech.aspe.org

**24-26** Energy Institute Risk Management Training Tripod Beta Methodology, London, UK
Contact: www.energyinst.org

**26** The 7th Annual Structures Symposium, Structural Engineers Association of Illinois, Maggiano’s Little Italy, Chicago, IL
Contact: www.seaoi.org/event/7th-annual-structures-symposium

**26** CMAA Seminar: Keys of Negotiation, The Southern California Chapter of the Construction Management Association of America (CMAA), Long Beach Marriott, Long Beach, CA
Contact: www.cmaasc.org

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**JUNE 2018**

**11-14** AACE International’s 2018 Annual Meeting, AACE International Manchester Grand Hyatt, San Diego, CA
Contact: phone 1-800-858-COST fax (304) 291-5728 info@aacei.org web.aacei.org

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Please submit items for future calendar listings at least 60 days in advance of desired publication.

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