

# **63rd AACE International Conference & Expo 2019**

New Orleans, Louisiana, USA  
16 - 19 June 2019

Volume 1 of 2

ISBN: 978-1-5108-9014-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2019) by AACE International  
All rights reserved.

Printed by Curran Associates, Inc. (2019)

For permission requests, please contact AACE International at the address below.

AACE International  
1265 Suncrest Towne Centre Drive  
Morgantown, WV 26505-1876  
USA

Phone: +1.304-296-8444  
Fax: 1.304.291.5728

[info@aacei.org](mailto:info@aacei.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# 2019 AACE® INTERNATIONAL TRANSACTIONS

## Table of Contents

### BUILDING INFORMATION MODELING (BIM)

BIM-3072	<i>The Constructible Process – Moving Beyond BIM to Build with Confidence...1</i>	Jon Fingland
----------	---	--------------

### CLAIMS AND DISPUTE RESOLUTION (CDR)

CDR-3110	<i>Concurrency and Pacing - Does Intent Matter?...16</i>	Josh Chittick; John C. Livengood, Esq. CCP CFCC PSP FAACE
CDR-3145	<i>Perfecting the Fixed Perspective Windows Delay Analysis...38</i>	John Jackson
CDR-3147	<i>A New Role for Project Control Professionals on Dispute Boards...54</i>	James G. Zack, Jr. CFCC FAACE Hon.Life
CDR-3162	<i>Identifying the As-Built Critical Path Using Recommended Practice 29R-03...72</i>	Andrew Avalon, PE PSP; Christopher W. Carson, CEP DRMP PSP FAACE; John J. Ciccarella, PE CCP PSP FAACE; Kenji P. Hoshino, CFCC PSP; John C. Livengood, Esq. CCP CFCC PSP FAACE; and Mark C. Sanders, PE CCP CFCC PSP
CDR-3167	<i>Home Office Overhead – Which Formula Should You Use?...96</i>	Mark F. Nagata, PSP
CDR-3173	<i>Defending Against Loss of Productivity Claims...117</i>	Dr. Tong Zhao, PE PSP; J. Mark Dungan; Xuyang Liu
CDR-3178	<i>Overhead Costs in Delay and Productivity Claims...128</i>	Christi Fu, PE
CDR-3193	<i>How to Best Prepare for and Navigate a Subcontractor Default Insurance (SDI) Claim...139</i>	Michael J. Oliveri, PSP; Joseph W. Wallwork, PE CCP CFCC PSP FAACE
CDR-3214	<i>Understanding and Applying the Elements of Constructive Acceleration...149</i>	Cory R. Milburn, CFCC PSP; Brian J. Furniss, PE CFCC PSP; Matthew Nichols, PSP
CDR-3228	<i>Hot Tubbing Expert Witnesses – Does It Work?...169</i>	James G. Zack, Jr. CFCC FAACE Hon.Life
CDR-3250	<i>Legal and Practical Challenges to the Implementation of the Time Impact Analysis Method...185</i>	Dr. Waleed El Nemr; Hossam Eid Mohamed, EVP
CDR-3254	<i>Claims Avoidance in Infrastructure Megaprojects: A Process Framework for Design-Build Contractors...200</i>	Rahul S. Mulik, CCP
CDR-3260	<i>Damages Without a Cause: Liquidated Damages Are a Penalty When Owners Recover Damages for Their Own Delay...219</i>	Christopher J. Brasco; Kathleen O. Barnes; James G. Zack, Jr. CFCC FAACE Hon. Life; Kenji P. Hoshino, CFCC PSP; Matthew D. Baker

### COST AND SCHEDULE CONTROL (CSC)

CSC-3107	<i>The Power of Projections: Innovative Schedule Forecasting Techniques...239</i>	Ken Carrico; Eric Dembert, PE; Mike Hollowell; Jeff Johannsen, PE; Jesse Lund, CCP PSPi
CSC-3132	<i>The Clear Flow Matrix: An Effective Production Control Technique Using Crew Level Planning...271</i>	Augusto Tiezzi; David Lott, PE; Wayne Lott; Dr. John D. Borcharding; Dr. William J. O'Brien

### PROFESSIONAL DEVELOPMENT (DEV)

DEV-3045	<i>Problem Analysis using Statistical Safeguards...298</i>	Gregory J. Whiteside, PE CCP; James D. Whiteside II, FAACE
DEV-3224	<i>14 Key Areas to Improving Your Cost and Schedule Team's Performance...316</i>	Stephen M. Beck, CCP

### ESTIMATING (EST)

EST-3184	<i>Estimate Validation and Bias Assessment: Ratio-to-Driver Method...345</i>	John K. Hollmann, PE CCP CEP DRMP FAACE Hon.Life
EST-3201	<i>Predictive Analytics Can Improve Cost Estimating for Smart City Projects...367</i>	Anthony DeMarco; Richard Mabe; Grady Noll

## 2019 AACE® INTERNATIONAL TRANSACTIONS

EST-3252 *Cost Estimating in Hyperinflation Economies...393* Francis Lira Vargas

### EARNED VALUE MANAGEMENT (EVM)

EVM-3155 *Use of Earned Value Management as a Communication Tool With the Project Team and the Client...407* Edward M. McNamee; Charles W. Immonen

EVM-3161 *EVM Application: Quantifying Values in Various Industries and Project Phases...421* Pranab Kumar Deb, P.Eng PSP; Jatin Jajal, P.Eng. CCP CEP EVP

EVM-3165 *Unpacking Earned Value Management for Oil and Gas Projects...448* Anton W. van der Steege

EVM-3251 *How to Calculate Estimate at Completion at a Project Level...472* Mostafa AbdelRazik, EVP PSP

EVM-3265 *Earned Value Challenges in Projects With Different Project and Functional Currencies...488* Petronella Anna Cronje, CCP EVP

EVM-3271 *Emergent EVM Techniques for Construction Schedule Performance Measurement and Control...510* Farah S. Demachkieh; Mohamed-Asem Abdul-Malak

EVM-3272 *Comparative Analyses of Construction Cash Flow Predictions Using Empirical S-Curves...555* Farah S. Demachkieh; Dr. Mohamed-Asem Abdul-Malak

### INFORMATION TECHNOLOGY (IT)

IT-3064 *Standard Cost Management from Spreadsheets to Automation...597* Ashley Garza; Sharla Gill

IT-3089 *Cloud-Based DMS for Large and Complex Projects...609* Lan Zhang; Hao Hu; Zhiyang Ji

IT-3289 *Integrated Software Based Project Controls on Major Capital Projects...629* Abhoy Ganguli, CCP CEP

### OWNER ISSUES (OWN)

OWN-3056 *Reference Class Forecasting: Theory and Practical Application...641* J. Michael Devine, CCP; Rob Adkison, PE CCP

OWN-3109 *How Can Nuclear Construction Costs be Reduced? Five Practical Tips to Improve Nuclear Project Economics...658* Arnaldo M. Angelini PE; Apostolos (Tolis) Chatzisyseon; Sean T. Regan CCP EVP CEP PSP FAACE

OWN-3168 *Estimating the Optimal Size of the Project Management Team...694* Aileen A. Jamieson

OWN-3185 *Planning the Future: Estimating U.S. Nuclear Stockpile Infrastructure Costs...709* Fana Gebeyehu-Houston; Charles Loelius; Cash Fitzpatrick; Dipali Amin; Julie Anderson; Charles Ballowe; Jeff Beck; Chad Daughters; Connor Jones; Al Levinson; Christopher Massey; Matt Proveaux

OWN-3187 *Los Angeles Metro Fast-Track Capital Program Management Best Practices...737* Julie K. Owen, CCP PSP FAACE; Sean A. VonFeldt

OWN-3196 *The Role Owner Project Control Plays in Contract Administration...754* Christopher Michalak; Paul G. Williams

OWN-3222 *Progress Measurement for Owners...773* Ferdinand R. Karbowski, Jr. PSP

OWN-3229 *What if the System Doesn't Fit? (A Proposal for Classifying Nuclear Tooling & Maintenance Project Estimates Using GAO's Technical Readiness Assessment)...794* Shoshanna Fraizinger, CCP

OWN-3236 *Optimizing Your Management Reserve...811* J. Gustavo Vinueza C.

### PROJECT MANAGEMENT (PM)

PM-3062 *Pre-qualifying Contractors for Today's Project Delivery Needs...841* H. Lance Stephenson, CCP FAACE

PM-3085 *Portfolio Management: Case Study of a Brazilian Mining Company...877* Ricardo Gonçalves Alves

## 2019 AACE® INTERNATIONAL TRANSACTIONS

PM-3105	<i>Program Management Lessons Learned: Alaskan Way Viaduct Replacement Program...900</i>	David Sowers, PE; Harry Jarnagan, PE CCP; Brian Smith, CCP
PM-3124	<i>Disruption Quantification in Small and Medium EPC Projects: A System Dynamics Model...929</i>	Michael Mac Guinness
PM-3134	<i>Aerial Data Collection Accuracy and Insights to Infrastructure Decisions...944</i>	Blaine Horner; Ryan Mextorf; Kyle Schroeder; Shanna Hawley; Timothy Bail; Travis Featherby; Vinay Nair, PE
PM-3151	<i>Optimized Cash-flow: Opportunities for Finance Solutions for Contractors and Owners...960</i>	Ashraf Elazouni
PM-3259	<i>Introducing Safety Measures Early in the Project Improves Success...978</i>	Chantale Germain, P.Eng.; Dr. Nathalie Drouin

### PLANNING AND SCHEDULING (PS)

PS-3047	<i>The Art of Decoding Manipulated Schedules for Forensic Schedule Analysis...998</i>	Gayathri Shetty, PSP; Rachel Domingo, PSP
PS-3082	<i>Float Consumption and Resiliency Theory Put into Practice...1019</i>	Greg M. Hall, PSP
PS-3086	<i>The Great Debate: Owners vs. Contractors - Are We Done Yet?...1030</i>	Jeffrey Milo, PSP; John P. Orr, PSP
PS-3087	<i>Examining Schedule Performance in Phase Transitions on Vertical Construction Projects...1042</i>	Daniel P. Gilmour, PSP; Matthew L. Pringle, PSP
PS-3101	<i>Schedule Trend Control Charts in Excel...1065</i>	Bryan Eaton, CCP PSP
PS-3112	<i>Capital Improvement Program Stage-Gate Planning &amp; Scheduling...1092</i>	Mir M. Ahmad; Christopher W. Carson, CEP DRMP PSP FAACE
PS-3120	<i>Integrating the Last Planner System® into the Critical Path Method Schedule...1111</i>	Jonathan R. Hunt; Hannah E. Schumacher, PSP
PS-3141	<i>Benchmarking As-Built Lags...1123</i>	Ronald M. Winter, PSP FAACE
PS-3181	<i>Who Owns the Dates of the Procurement Package Status Report? Practical Application on a Megaproject...1145</i>	Lise Bouchard, CCP; Stefan M. Sonnenberg, PSP
PS-3217	<i>Mastering Out-of-Sequence Progress – Part 3...1161</i>	Ronald M. Winter, PSP FAACE
PS-3243	<i>Which Schedule Quality Assessment Metrics to Use? ... and When?...1198</i>	Shoshanna Fraizinger, CCP
PS-3244	<i>Understanding Risk in Design-Build Schedules...1221</i>	Jessica M. Colbert, PSP; Kimberly D. Forbes, PSP
PS-3255	<i>The Benefits of the Linear Scheduling Method for Reviewing Non-Linear Projects...1233</i>	Stanko Pavlovic, P.Eng. PSP
PS-3261	<i>Reporting Tool Primavera P6 Visualizer...1254</i>	Marina G. Sominsky, PSP
PS-3283	<i>The Habits of Highly Effective Scheduling...1277</i>	Sylvia M. Donado
PS-3293	<i>Lessons Learned on Integrating Linear Schedule with the CPM Schedule...1290</i>	Kristy Kastner, PSP

### DECISION AND RISK MANAGEMENT (RISK)

RISK-3037	<i>Combining Parametric and CPM-based Integrated Cost-Schedule Risk Analysis...1310</i>	Colin H. Cropley
RISK-3055	<i>Holistic Risk Management...1347</i>	Eric Ho
RISK-3078	<i>Cost and Schedule Risks Interact in Megaprojects...1359</i>	Dr. David T. Hulett, FAACE; Waylon T. Whitehead
RISK-3111	<i>Identifying the Most Probable Cost – Schedule Values from a Joint Confidence Level (JCL) Risk Analysis...1387</i>	Samuel Steiman, PE; Dr. David T. Hulett, FAACE
RISK-3129	<i>Lessons from Financial Risk Management...1437</i>	Eric Ho
RISK-3175	<i>Actions for Improving Risk Management Culture...1449</i>	Aaron P. Ingebritson, PE

## 2019 AACE® INTERNATIONAL TRANSACTIONS

RISK-3208	<i>Risk Allocation to Assess Public Contract: Particular Case - Brazil...1464</i>	Helber Cunha Macedo; Carlos Eduardo M. F. Braga; Cesar Teodoro Ferreira; Fabrizio Cesar R. Fonseca
RISK-3294	<i>Some Key Points of Contingency Drawdown Curves...1482</i>	Kim Kozak, PE; David A. Norfleet, CCP CFCC DRMP

### TOTAL COST MANAGEMENT (TCM)

TCM-3049	<i>Sensitivity Analysis of Discount Rates for Life-Cycle Costing of Pavements...1496</i>	Dr. Robert L. Schmitt, PE; Dr. Samuel Owusu-Ababio, PE
TCM-3063	<i>Strategic Portfolio Management: Supply Chain Methodologies?...1514</i>	H. Lance Stephenson, CCP FAACE
TCM-3106	<i>Accurate Quantity Update: A Key for Project Management Success...1556</i>	Huimin Shi, CCP PSP
TCM-3189	<i>An Integer Programming Model for Capital Project Portfolio Planning...1570</i>	Michael Matosin
TCM-3245	<i>Cost Engineering as a Driver of Capital Efficiency...1602</i>	Anthony M. Bazzini; Robert F. Addotta
TCM-3291	<i>The Case for a Recommended Practice for Project Procurement in Public Construction...1614</i>	Bryan Payne, PE CCP CFCC Esq.; H. Lance Stephenson, CCP FAACE

### TOTAL COST MANAGEMENT ANALYTICS (TCMA)

TCMA-3054	<i>Data Analytics to Drive Reporting and Insights for Timely Decisions and Improved Business Performance...1636</i>	Aleshia Ayers; Susan Bomba, PE; Lamis El Didi
TCMA-3130	<i>Implementing UniModel in an Owner Environment...1658</i>	John B. Newman, CCP CEP; Philip D. Larson, CCP CEP PSP FAACE
TCMA-3227	<i>Forecasting Cost to Complete on Major Projects...1674</i>	Christopher Ronak
TCMA-3278	<i>Developing and Implementing Visual Dashboards Using P6 Data...1699</i>	Gino Napuri, EVP
TCMA-3285	<i>Optimizing Construction Projects through Effective Information Governance and Data Analytics...1715</i>	Sean Callahan; Heather Leins; Sarah Lounsberry; Vinay Nair, PE; Trent Williams