



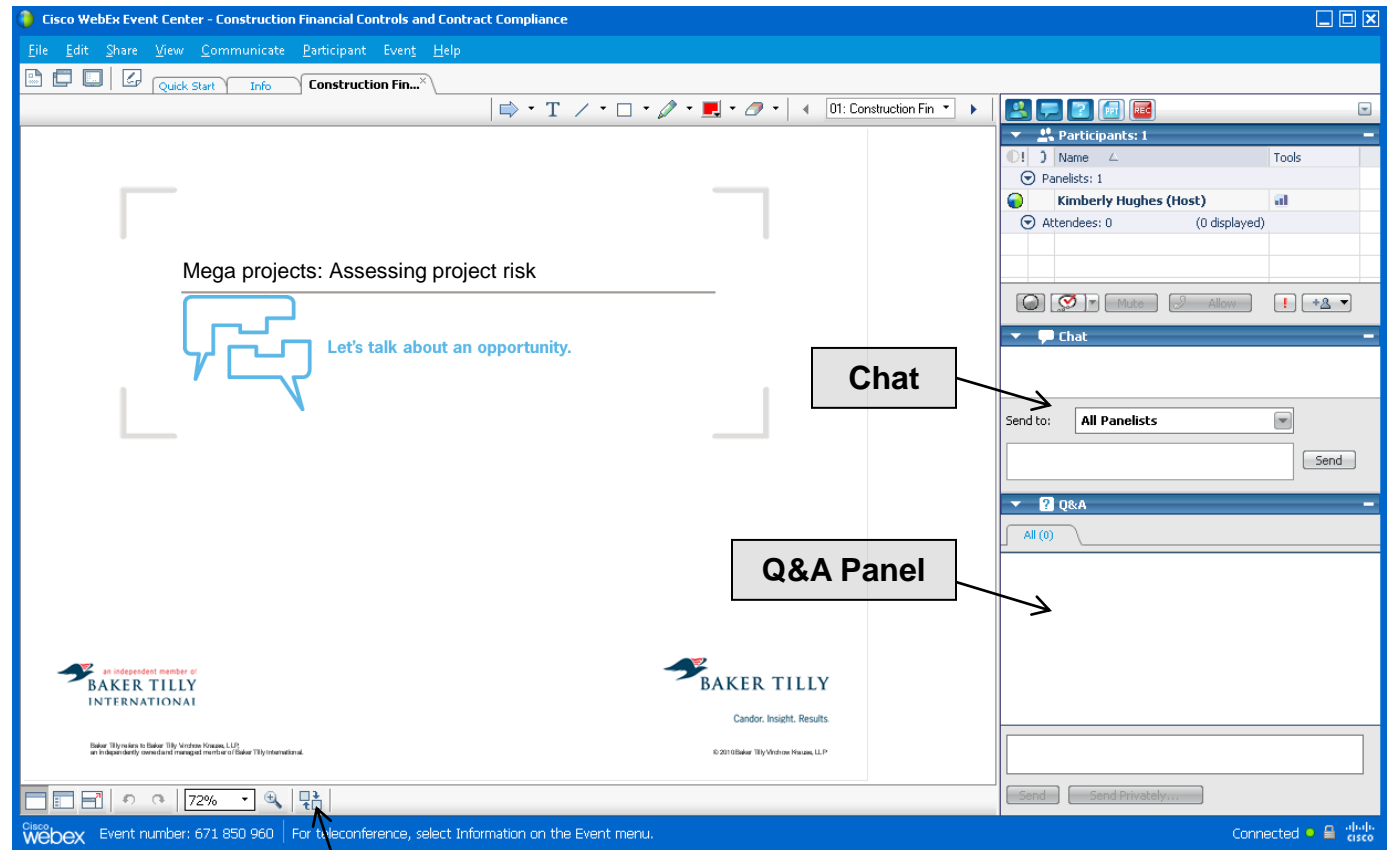
Auditing mega projects: Assessing project risk

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Tony Ollmann, CPA, CCA
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Auditing mega projects: Assessing project risk



Let's talk about an opportunity.



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Today's topics:



Polling question #1



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Were you able to attend or watch the recording of any of the previous construction cost control and audit webinars?

- A. Yes
- B. No
- C. Not yet, but I plan to view the recordings.

Please respond using the polling section in the WebEx screen to the right.

Learning objectives



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- > Identify unique characteristics of mega projects
- > Understand financial materiality factors
- > Evaluate the additional audit procedures required
- > Estimate the resources required to support the contract audit

Key terms



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- > EPC contract
- > Engineer to order
- > Procurement
- > VAT
- > Multiplier
- > Commissioning
- > Design Intent Documentation (DID)
- > Owner's project requirements (OPR)
- > Basis of Design

Mega projects are construction events that are:

- > Unique in design and function
- > Often cost in excess of \$1 billion
- > High profile
- > Complex funding programs
- > Contracts may involve services beyond construction
 - Engineering
 - Procurement
 - Architecture
 - Prototyping
 - Commissioning
 - Training
 - Documentation

Polling question #2



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Which of these project sites is NOT high risk?

- A. Off shore
- B. Remote
- C. Urban
- D. All of the above

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- > Facility function is highly complex
- > Functioning facility may deploy new technology
- > Facility site may be inhospitable locations
 - Remote locations away from construction resources
 - Environmentally dangerous locations
 - » Ocean
 - » Artic
 - » Desert
 - Urban sites
- > Substantial cost for failure to open on time

Contracting methods



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- > Engineer, Procure & Construction (EPC)
- > Engineer, Procure, Construction & Commission (EPCC)
- > Cost plus
- > Guaranteed Maximum Price (GMP)
- > Combination of the above

Construction contract audit methodology - preconstruction



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- > Understand the unique function of the facility
 - Interview project champions
 - Collect and review project business plans
- > Document key program business goals and objectives
- > Define threats, risk and consequences
- > Identify systems critical to achieving goals
- > Identify milestones critical measuring progress

Polling question #3



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**Are project
stakeholder interviews
part of your audit
planning process?**

- A. Yes
- B. No

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- > Facility type: Sports and Entertainment
- > Construction budget: \$2 billion
- > Financing package: Public and private funds
- > Promises are made to the community that local labor will be used to build the facility
- > Audit risks:
 - Failure to source labor from the community
 - Local labor is significantly more expensive than remote labor
 - Construction methods and low cost enable prefabrication outside of the local market minimizing labor requirements

And as with all construction contract audit
projects...

Read the contract and proposal documents

The major audit risk areas of a mega project are:

- > Reconciling progress and project billings
- > Identifying the cost of rework
- > Determining cost responsibility for piloting new ideas and technologies
- > Verifying the change order approval process
- > Confirming equipment and materials procured
- > Verifying milestones and time commitments are met
- > Verifying quality and performance guarantees are met
- > Change orders
- > Claims mitigation

Additionally, the mega projects utilize more services and a broader array of services

- > Rate schedules may be multiplier, cost plus, rate schedule, composite, or undefined
- > Transaction volumes are extremely high
- > Risk of duplicate payments are higher than normal
- > Prepayments, deposits, and advances are often made on long lead time items
- > Document volume can be overwhelming

Polling question #4



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Which of these are not common to mega projects?

- A. Engineer to order machinery
- B. Complex process and piping
- C. Repetitive and often previously designed facilities
- D. Contractor accepts the risk of construction

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Everything is bigger on a mega project

- > Materials management and supply chain controls
- > Controls testing takes a greater role in ensuring financial integrity
- > Third party stakeholders often include investment bankers, community leaders, suppliers, and lenders
- > Progress reporting is highly complex, how do we evaluate progress and ensure the project is not too overbilled?

On site visits are essential to managing these risks

- > Verifying performance guarantees
- > Cost of defects versus change orders
- > Delays and time extensions
- > Non-construction deliverables
- > Minimum performance

Grouping the risks by development life cycle function

- > Enterprise or business risk
- > Engineering
- > Procurement
- > Commissioning
- > Construction
- > General administration

- > Incomplete owner's project requirements (OPR)
- > Incomplete engineering documentation
 - Basis of design
 - Design intent documentation (DID)
 - Coordination drawings
 - Construction documents
- > Inadequate or incomplete procurement specifications
- > Schedule slippage
- > Offshoring engineering services
- > Project controls
 - Acceptance process failure

Polling question #5



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**Are offshore
resources, labor, or
materials common on
your projects?**

- A. Yes
- B. No

Please respond using the polling section in the WebEx screen to the right.

Case study – offshoring resources



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- > Facility type: Power plant
- > Construction budget: \$6 billion
- > Contract type: EPC
- > Contractor: Global service provider
- > Engineering fee schedule: Fixed billing rate schedule based on a planned 3.0 multiplier

Risks

- > Offshore technical resources fulfill substantial labor requirements
- > Offshore resources cost significantly less than domestic resources
- > The realized multiplier is 8.0 and not 3.0; however, the rate schedule prevents the owner from realizing the financial benefit of offshoring

Procurement project risks



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- > Comingled material and equipment costs with the contractor's other projects
- > Inferior material quality
- > Quantity shortages
- > Unplanned or authorized substitutions
- > Engineer to build failure
- > Security deposits
- > Long lead time management

Case study – global sourcing



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- > Facility type: Sports and Entertainment
- > Contractor: Global service provider
- > Global purchasing opportunity: Steel
- > Steel budget: \$155 million
- > Sourcing country: India
- > Potential savings: 15%

Risks

- > Quality control
- > Related entities
- > Comingled project costs
- > Delivery delays
- > Expedited charges
- > Increased cost if secondary domestic suppliers need to fulfill steel order

Construction risks



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- > Project controls failure
- > Quality assurance failure
- > Subcontractor and tertiary contractor claims
- > Change order pricing
- > Safety
- > Delays

Commissioning risks



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- > Functional performance test failure
- > Inadequate testing and inspection plan
- > Establishing goals for
 - Quality
 - Efficiency
 - Functionality
- > Documented performance acceptance
- > Documented operations and maintenance training
- > Quality reviewed operations and maintenance documentation

General administration risks



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- > Per diem abuse
- > Documentation control
- > Resource offshoring
- > Comingled resources
- > Disproportionate cost allocation
- > Inflated overhead rates

Case study – fee computation



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- > Facility type: Air pollution control system
- > Construction budget: \$2 billion
- > Contract type: EPC, cost plus 4%

Final application for payment

Cost of work	\$1,920,000,000
CM fee	\$80,000,000
Total project cost	\$2,000,000,000
Realized CM fee	4.16%
CM fee overstated by	\$3,200,000

Polling question #6



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**Was \$3,200,000
financially material to
the case study
project?**

- A. Yes
- B. No

Please respond using the polling section in the WebEx screen to the right.

- > Secondary and tertiary subcontractors
 - Pay application documentation
 - Right to audit
 - Claims avoidance
- > Lien waiver management
- > Compounded general conditions and construction management fees
- > Back-charges to subcontractors
- > Use of prefabricated components

Questions?



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Tony Ollmann, CPA, CCA
Director
608 240 2618
tony.ollmann@bakertilly.com

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