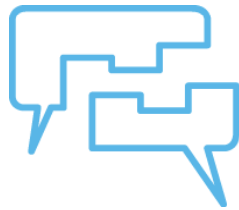


## Auditing Engineer-Procure-Construct (EPC) Projects

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Let's talk about an opportunity.



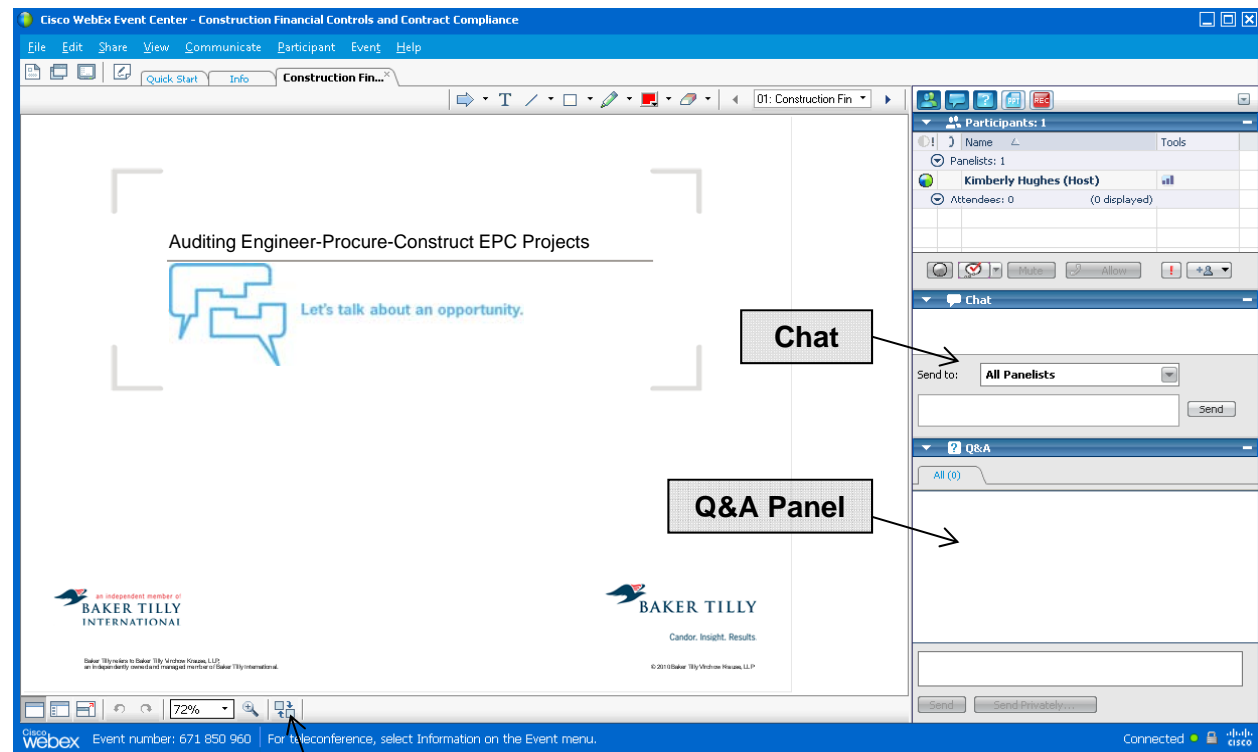
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# WebEx guide



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- > Established in 1931
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- > More than 1,480 professionals
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## About Baker Tilly



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# Introductions



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## Today's topics: Auditing EPC contracts



## 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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- > Understand the fundamental delivery differences between Engineer-Procure-Construct (EPC) and Architect-Procure-Construction (APC)
- > Learn to identify the unique contract audit risks of EPC
- > Learn to identify EPC contract audit red flags



## Key terms



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- > EPC
- > AEC
- > O&M
- > Commissioning
- > System turnover
- > EPCM
- > Liquidated damages
- > Performance guarantees
- > Default provisions
- > FEED delivery

## What is EPC?



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EPC is the construction industry acronym for Engineer – Procure – Construct.

EPC is a project delivery method most often associated with mega projects.

How does EPC compare with the more common delivery model of Architect – Engineer – Construction (AEC)?

- > Extensive process engineering
- > Significant plant piping
- > Custom designed equipment and machinery
- > Unique instrumentation and controls

For our purposes, EPC projects are primarily mega projects. Examples of these types of projects include:

- > Stadiums and sports facilities
- > Mining projects
- > Power generation plants
- > Refineries
- > Oil and gas storage facilities

## Polling question #2



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Do you have a mega project in your capital program?

- A. Yes
- B. No

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

### What do these mega projects have in common?

- > Very large capital investment
- > Highly complex engineering requirements
- > Specialized equipment
- > Owners requiring a turnkey solution

### Projects that are delivered under the EPC model do so because:

- > Technical challenge is complex and the solution may be undefined
- > Project delivery will be served by many technical disciplines
- > Project delays mean lost revenue to the owner
- > Project may utilize new and untested technology
- > Scope of work is so significant it is parsed into subprojects and deliverables
- > On time delivery may be more important than on budget

## EPC contract characteristics



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- > Integrated delivery method between the owner and the EPC contractor. Two party contract for multiple disciplines.
- > EPC contractor accepts the responsibility for the successful commissioning of the facility
- > EPC contractor accepts the responsibility for the quality of engineering and construction
- > EPC contractor accepts the consequences of schedule slippage and construction scope creep



## EPC contract characteristics



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- > Two defined scopes of work, engineering and construction
- > There may be three project budgets:
  - Engineering
  - Major equipment procurement
  - Construction
- > Each project budget may have individual pricing methodologies
- > Overall project may have a target price however this is not a guaranteed not to exceed price
- > Liquidated and consequential damages are severe to encourage on time delivery

## Polling question #3



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**Do EPC contracts always carry a fixed or lump sum contract value?**

- A. Yes
- B. No

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

### The major audit risk areas of an EPC contract are:

- > Reconciling progress and project billings
- > Identifying the cost of rework
- > 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

## EPC audit risks



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- > Initial contract terms may only define engineering rate schedules
- > Detail scope, deliverables and schedule are among the products of the engineering phase
- > 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

## Polling question #4



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Which of an these are not common to EPC projects?

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

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## EPC audit risks



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- > Materials management and supply chain controls
- > Controls testing takes a greater role in ensuring financial integrity
- > Joint ventures may result in multiple billing methods, terms and conditions
- > Earned value will be the substance of progress reporting

## EPC audit risks



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- > Committing sufficient audit resources
- > Identifying owner initiated change orders
- > Change order control
- > Engineering change notices
- > Shifting funds between budgets
- > Reconciling estimates and final pricing
- > Decomposing final pricing on custom engineered equipment

## EPC audit risks



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



The volume of transactions mandates using a automated processing tools like ACL or Idea.

During contract negotiations the owner needs to integrate data requirements into the contract amendments.

### Earned value analysis:

Measuring progress based the completion of agreed upon units of production:

- > Yards of concrete
- > Tons of steel
- > Linear feet of pipe

## Audit flags



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- > Growing and aging unresolved RFIs
- > Missed milestones and schedule slippage
- > Late or slow invoices
- > Missing lien waivers
- > Missing or lost documentation
- > Reluctance to schedule audit meetings
- > Auditor avoidance
- > Contractor information barriers
- > Inability to agree on progress

### Facts

- > Scope: power generation and transmission system
- > EPC contractor responsible for turnkey solution through the first year of operations and maintenance
- > EPC contract value \$6.4 billion including \$800 million for operations and maintenance

Audit program included reconciling O&M charges with as built drawings

Specific action items included:

- > Tracing certified and serialized inventory to work orders and inspection reports
- > Verifying installation and or replacements with on progress photos

### Findings

- > O&M charges included material costs for previously installed serialized materials
- > O&M charges included labor and materials for unfinished original construction

### Consequences

- > Contractor credited the owner \$16 million against the O&M budget
- > Contractor credited the owner an additional \$6 million against the original construction budget

### Facts

- > Scope: Redevelop former military base to include major league sports facility, healthcare, infrastructure and residential development
- > Budget: >\$4 billion
- > Contract terms included an overhead rate based on Federal Acquisition Regulations (FARs)

### Audit program included verifying overhead computation

#### Specific action items included:

- > Decomposing overhead rate
- > Computing overhead rate based on federal guidelines
- > Reconciling differences



### Findings

- > Overhead rate included non-allowable depreciation expense
- > Overhead included principals bonuses
- > Overhead included proposal costs

### Consequences

- > Overhead rate was adjusted down 6.5%
- > Retroactive impact was an owner's credit of in excess of \$11 million

Questions?



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## Questions?

Please feel free to ask questions in the screen to your right.

We will answer as many questions as time permits.

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## Contact information



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CPE certificates will be mailed to you in about six weeks.

Thank you for participating today!

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