Tackling the Unique Challenges of Mega Projects

ECC Annual Conference
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Tackling the Unique Challenges of Mega Projects

Panelists:

Vince Alberico
ExxonMobil

Peter A. Bickham
Colt Engineering

George F. Jergeaus
University of Calgary

Roel Van Doren

Moderator:

Janice L. Tuchman
(ENR)

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Redefining Our Industry

Solutions through Collaboration, Innovation and Organization

Forum: Tackling the Unique Challenges of Mega Projects

Janice L. Tuchman
Moderator

Editor-in-Chief
Engineering News-Record
McGraw-Hill Companies

30 years covering construction's mega projects around the globe

Leads ENR's team covering mega projects in print, online and at global events

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Redefining Our Industry

Solutions through Collaboration, Innovation and Organization

Defining Mega Projects

- Cost > $1 billion plus
- New technology development or extension of existing technology
  - Step out in size and scale
- Significant interfaces / complexity
  - Many players with different interests and motives
- Most significant issues & risks must be managed at a level above the project team
- Fast tracked

Mega Project Challenges

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Vince Alberico
Panelist

Project Executive
ExxonMobil Refining & Supply
Fairfax, VA

33 Years Project Development & Execution and Refinery Experience
Project Lead on Several Mega Projects

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Redefining Our Industry

Solutions through Collaboration, Innovation and Organization

Keys to Project Success

- **Effective early planning**
  - Early involvement of key contractors & suppliers
  - Partner involvement; proper project governance
  - Decision making responsibilities clearly defined
  - Comprehensive Project Execution Plan
- **Critical Issues / Risks Identification**
  - Define local & global issues
  - Early identification & management
  - Stewardship of mitigation plans
- **Effective Communication & Alignment Process: George Jergeas**
  - Clear statement of project objectives & goals; communication throughout project team
  - Rigorous Stewardship Process
  - Use of Steering Committees and Approval Boards

Keys to Project Success

- **Early Definition of Scope → Achievable Cost & Schedule**
  - Early design and design optimization involving owner, contractors and key suppliers
  - Continuous market monitoring & periodic cost surveys
  - Schedule validation using historic norms
- **Understanding of economics of scale**
  - When do these hold
- **Appropriate Contracting Strategies**
  - Use of Program Management Contractor
  - Multiple large contracts vs. consortium → interface management
  - Lump sum vs. reimbursable compensation
  - Effective work Breakdown structure
    - Vertical splits vs. horizontal splits
  - Early Contractor evaluation

Key to Project Success

- **Proper Execution Strategy**
  - Applicability of Phased execution
  - Comparison to historic norms
  - Use of modularization
  - Early identification of constraints → engineering, manpower, supervision, camp, logistics, material deliveries
- **Construction Planning & Management**
  - Plot layout & work sequencing
  - Construction infrastructure planning
  - Labor management → Productivity enhancement
- **Materials Management**
  - Critical equipment identification
  - Vendor participation
  - Transportation & Logistics
  - Laydown & storage

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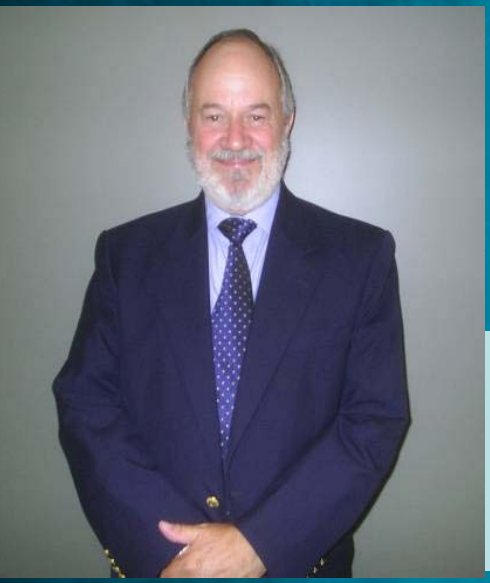


Peter A. Bickham
Panelist

Project Director,
Colt Engineering Corporation
Worley Parsons Canada

- 42 Years Project Execution Experience
- 20+ years Oil Sands Experience
- Lead Execution Teams on Mega Projects
- Currently Leads Colt's team on Suncor Voyageur Project

Oil Sands Development Challenges

Location

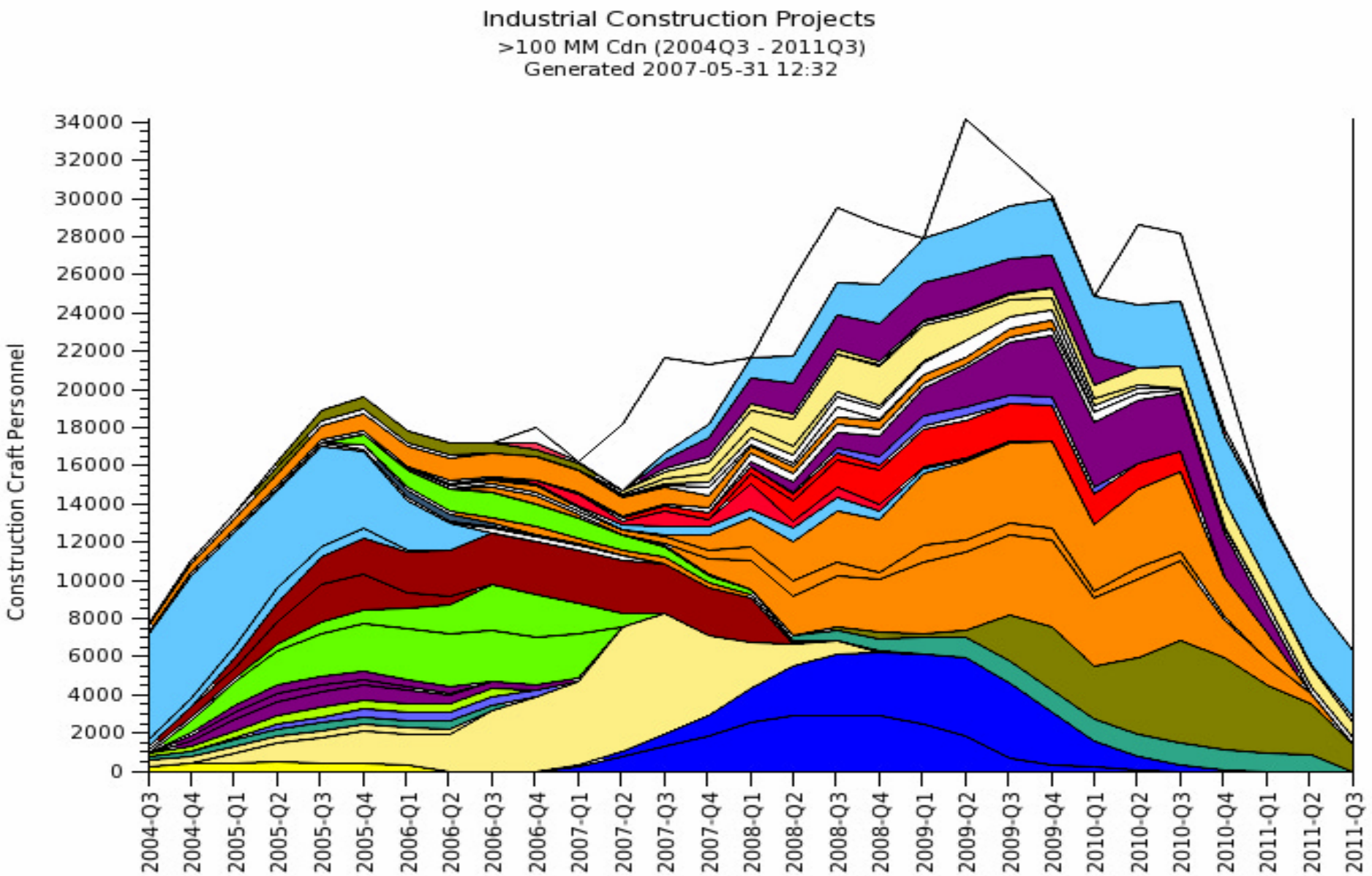
- Logistics & Transportation
- Infrastructure
- Extended supply lines
- Labour resources
- WInter

Design Concepts

- Water & Environmental
- Economies of scale
- Product value enhancement
- Product shipment

Execution

- Project Size & complexity
- Project cost structure
  - Operating Capital
  - Capital
- Project Schedule
- High Risk Ventures


Industrial Construction Projects
>100 MM Cdn (2004Q3 - 2011Q3)
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Construction Craft Personnel
34000
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
2004-Q3
2004-Q4
2005-Q1
2005-Q2
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2005-Q4
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2011-Q1
2011-Q2
2011-Q3

Oil Sands Development Challenges (continued)

Mitigation Actions

- Move work to available resource
  - Engineering / Design
  - Modularization
- Improve Productivity
  - Workforce planning
  - Collaboration agreements
  - Rework Limitation
  - Adopt construction readiness strategies
  - Work force development

- Share Risks
  - Contracting arrangements
  - Use international marketplace
  - Harmonize stakeholder goals
  - Create larger markets
  - Supply Chain relationships

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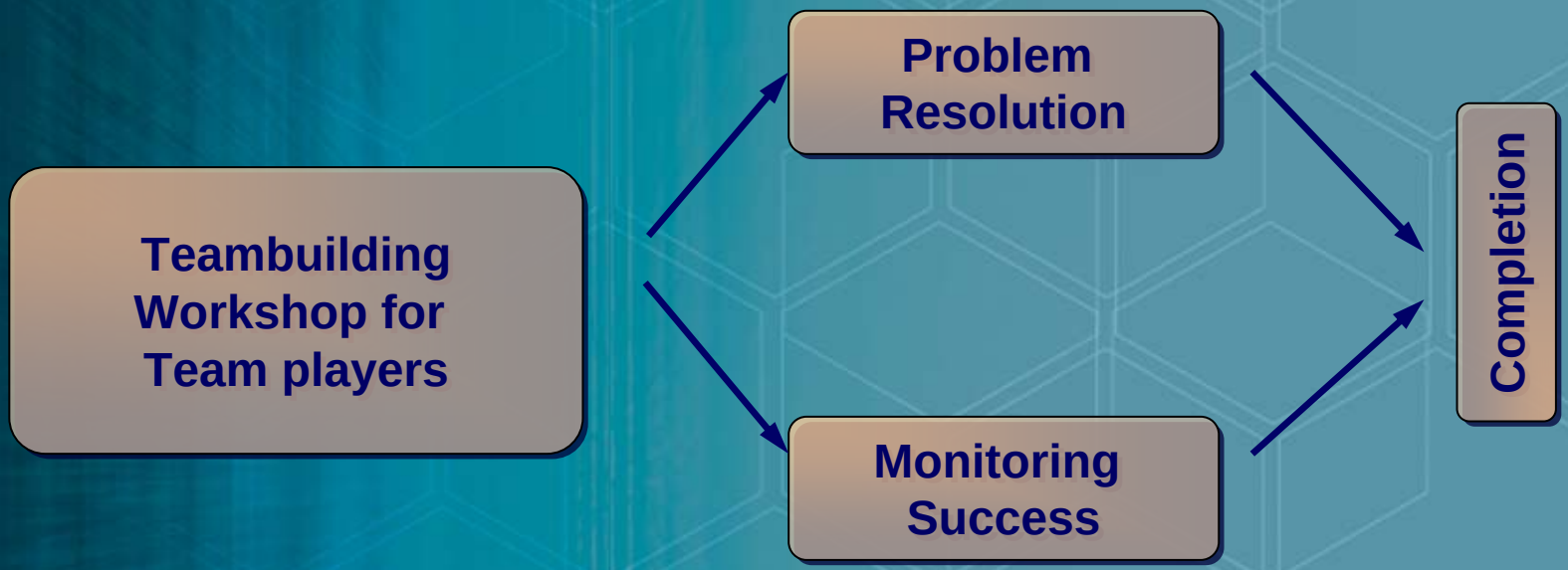
George F. Jergeas
Panelist

Professor
University of Calgary
Alberta Canada

BSc Civil Engineering 1975
Civil Engineering contractor 1975-1986
MSc (1982) and PhD Construction Management, Loughborough, UK (1989)
Claim consultant, Revay and Associates, 1989-94

Build and Sustain the Team



On going Support

Guiding Principles: Example
Rockyview General Hospital

We, the team of the Redevelopment Project, recognizing the unique nature of this project, commit to creating an environment of trust and open communication to deliver a quality project, which meets or exceeds each stakeholder group's requirements. We commit to maintaining a seamless, positive, and optimistic work environment in which all partners' goals can be achieved.

Capital Project - 2004

The following goals and objectives were agreed and recorded as the Partnering Team Charter for the project.

1. Produce a project that is safe in its design, construction, maintenance and use.
2. Create a safe-working environment resulting in zero lost-time incidents.
3. Minimize the inconvenience to the patients, visitors, care providers and protect the facility, community and the environment.
4. Design and construct a project of optimum quality, which is functional, flexible, maintainable, sustainable and of which we are proud.
5. Goal of project is to have zero claims.
6. Provide a non-confrontational forum for the resolution of any disputes that arise.
7. Encourage innovation and creativity.
8. Understand each party's role within the project team and develop good relationships based upon trust, respect and honesty.
9. Manage the project effectively, efficiently and manage stakeholder change requests.
10. Incorporate and share lessons learned from other projects and gained from outside sources/experience.
11. Maintain positive, cooperative relationships through; clear and open communication, no surprises, no hidden agendas, minimum delays of paperwork, and resolution of problems quickly at the lowest level.
12. Prepare, update, and share common project schedule.
13. Deliver project on schedule and within budget.
14. Co-ordinate efficiently with other hospital projects as much as possible.
15. Empowerment of all team members to allow decision making at all levels.
16. Improve budget management by regular review and tracking of cost accounts and early communication of cost overruns and changes.
17. Manage scope changes in a fair and timely manner.
18. Acknowledge the requirements connected with infection, prevention and control.
19. Have fun and create an enjoyable work environment.

Monitoring Success and Performance

Date: Name: Firm:

COMMUNICATION				
1	Communications are…	difficult, guarded	1 2 3 4 5	open, up-front
2	Information flow is…	restricted	1 2 3 4 5	free, open
3	Timeliness of information is…	late	1 2 3 4 5	on-time
WORKING RELATIONSHIPS				
4	Cooperation between parties is…	poor, detached	1 2 3 4 5	good, unreserved
5	Issues and concerns are…	ignored	1 2 3 4 5	dealt with quickly
6	Responses to issues become…	personal	1 2 3 4 5	project problems
7	Disputes are addressed…	ineffectively	1 2 3 4 5	efficiently
8	Problems are resolved by…	senior management	1 2 3 4 5	lowest level
	TECHNICAL REQUIREMENTS			
9	Safety performance is…	not acceptable	1 2 3 4 5	Acceptable
10	Overall quality is…	not acceptable	1 2 3 4 5	Acceptable
11	Value for money is	not acceptable	1 2 3 4 5	Acceptable
STAKEHOLDER & EXTERNAL ISSUES				
12	Public complaints are…	frequent	1 2 3 4 5	Infrequent

Please list examples for point 1 – 12 above that you rated 1 or 2

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Roel Van Doren
Panelist

Vice President,
Refining and Chemical Industry Center
Emerson Process Management

BSc Mechanical Engineering, K.U. Leuven Belgium 1986
Advanced Management Program, INSEAD – 2004
Sales/Director – Emerson Process Management 1998-2000
Vice-President Refining and Chemical Industry Center
Emerson Process Management, 2004-Present

Discussion…

Questions?