Risks of International Projects: Reward or Folly?

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The Opportunity

- $ Trillions of project capital.
  - ✓ International projects have unique set of risks.
- Found no standard methodology for risk assessment.
- Holistic approach to risk management would be best--disconnects.

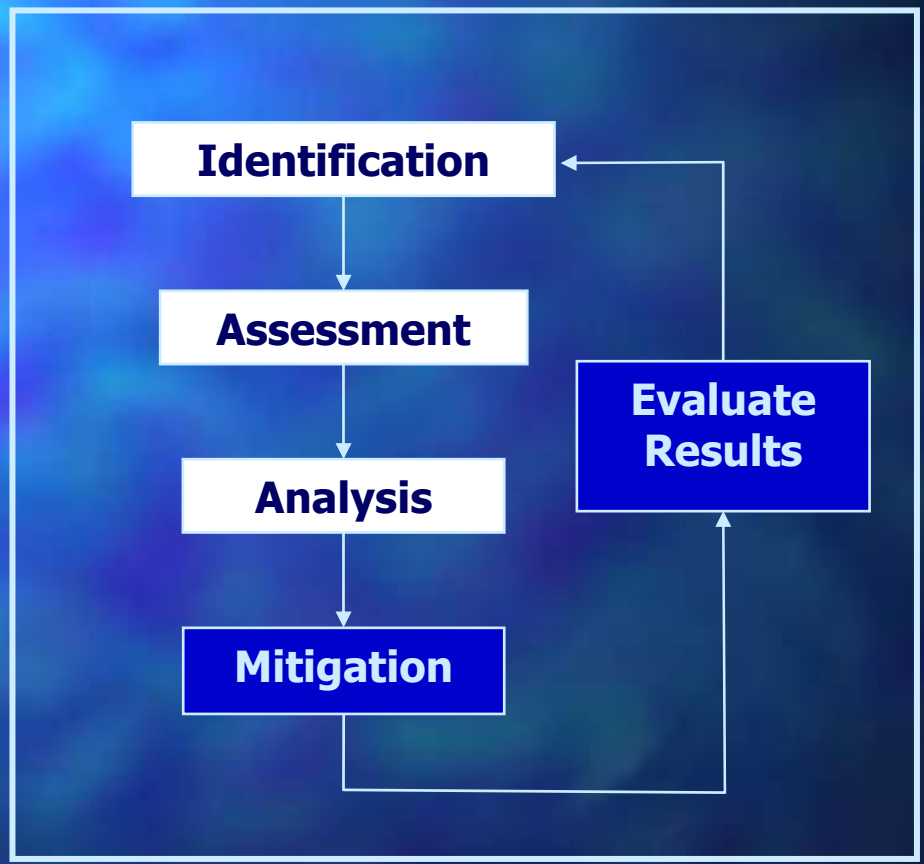
The Question

Can risks be systematically and effectively addressed on international projects, or is it folly to attempt this process?

Our Scope

Enhancing risk assessment for international projects with attention to the risk management process.

The Risk Management Process



Early Research Findings

- Need for tool/method to identify potential areas of risk
  - ✓Easy to implement and use
- Should take entire project life cycle into consideration
- Gives consideration to owner/investor and contractor risks
- Desirable to identify most critical risks

Our Scope--the International Project Risk Assessment (IPRA) Tool

- **International** – a project performed by North American investors, owners, and/or contractors that is executed outside of North America.
- **Projects** – Construction Capital Projects
- **Risk Assessment** – Includes Risk Identification and Assessment.
  - ✓ Assists on Risk Planning and Documentation.
  - ✓ Excludes Risk Handling and Control.

IPRA Development Process

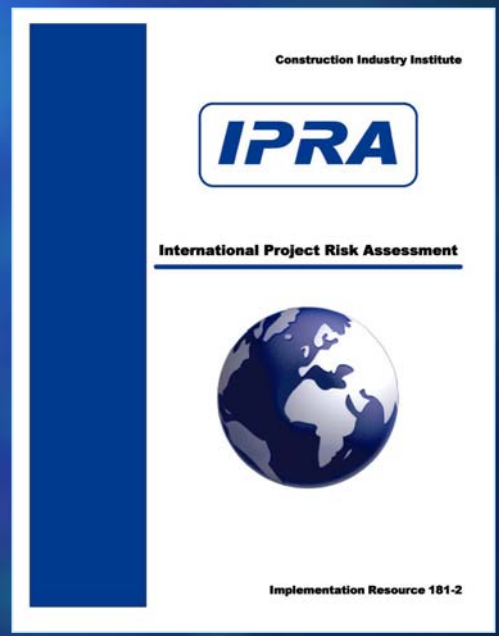
- Developed Risk Elements and descriptions.
- Created assessment process.
- Conducted workshops to develop Relative Impacts.
- Tested using actual projects.

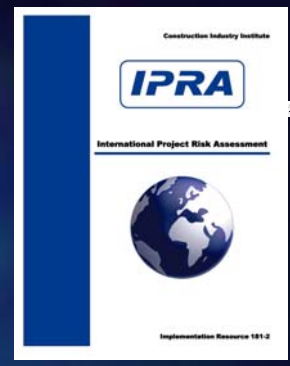
Total Research Effort

- 113 participants
- 58 companies/organizations
- 65 projects, approx. $27 billion
- Five workshops

Why An International Project Risk Assessment Tool?

To improve the ability to assess risk in an international environment





IPRA Tool and Process

- Focuses on issues that are international-project specific.
- Includes investor, owner, contractor, and operations issues.
- Provides a formal method to identify and assess international risk.

IPRA Tool and Process
(continued)

- Allows the project team to evaluate risk elements through the full project life cycle.
- Provides an assessment to indicate critical risk factors for mitigation.
- Provides a structure for analysis.

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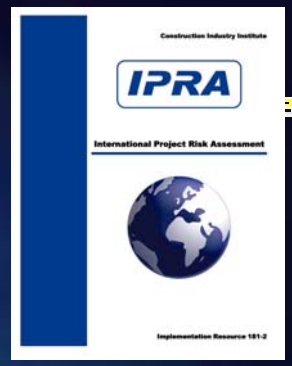

Portfolio of Risks

IPRA Development

Research Committee input, interviews, workshops with owners, contractors, and others

Risk Assessment Sheet - SECTION I – COMMERCIAL

CATEGORY		Likelihood of Occurrence (L)					Relative Impact (R)					Baseline	Coordinate L, R	Comments
		Very Low →				Very High	Negligible →				Extreme			
	NA	1	2	3	4	5	A	B	C	D	E			
I.A. BUSINESS PLAN														
I.A1. Business case														
I.A2. Economic model / feasibility														
I.A3. Economic Incentives/ barriers														
I.A4. Market/Product														
I.A5. Standards and practices														
I.A6. Operations														
I.A7. Tax and tariff														
I.B. FINANCE/FUNDING														
I.B1. Sources & form of funding														
I.B2. Currency														
I.B3. Estimate uncertainty														
I.B4. Insurance														

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IPRA Tool
Structure

- Section I Commercial
  - ✓I.A Business Plan
  - ✓I.B Finance/Funding
- Section II Country
  - ✓II.A Tax/Tariff
  - ✓II.B Political
  - ✓II.C Cultural
  - ✓II.D Legal

IPRA Tool

Structure (cont.)

- Section III Facilities
  - ✓III.A Product Scope
  - ✓III.B Sourcing and Supply
  - ✓III.C Design/Engineering
  - ✓III.D Construction
  - ✓III.E Start-Up
- Section IV Production/Operations
  - ✓IV.A People
  - ✓IV.B Legal
  - ✓IV.C Technical

IPRA Tool

Structure - Elements

Section I Commercial

I.A Business Plan

- I.A.1 Business Case
- I.A.2 Economic model / feasibility
- I.A.3 Economic Incentives / barriers
- I.A.4 Market
- I.A.5 Standards and Practices
- I.A.6 Operations
- I.A.7 Tax and Tariff

IPRA Tool
Example Element Description

Element Title

I.A1. Business case

The overarching business objectives should define the strategies and assumptions that support the pr relation to corporate strategy and investment goals. The business e an assessment of corporate competence, managerial challenges, and technica feasibility of delivering international projects. The rationalization to pursue the international project includes the following items:

Think about....

- ❑ Potential funding sources
- ❑ Project fit with the organization's busi ess strategy
- ❑ Current or planned business presence n the jurisdiction
- ❑ Joint venture/partnering considerations
- ❑ Adequate human resource infrastructu e and the existence of the management wherewithal and expertise
- ❑ Experience and history with thi venture, and market
- ❑ Experience with other partners, liers, and/or labor-base in this country
- ❑ Timing of project aligning with
- ❑ Existence of an executive/corporate champion
- ❑ Attention to corporate image and responsibility
- ❑ Receptiveness and culture of host governments and citizens
- ❑ Mutuality and alignment of expectations between investors and host
- ❑ Social and political issues surrounding and impacted by the business venture
- ❑ Social unrest/violence
- ❑ Other

Element Definition

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IPRA Tool

Assessment Sheet

Baseline Relative Impact

CATEGORY	Likelihood of Occurrence (L)						Relative Impact (I)					Baseline	Coordinate L, R	Comments
		Very low →				Very High	Negligible →				Extreme			
	NA	1	2	3	4	5	A	B	C	D	E			
I.A. BUSINESS PLAN														
I.A1. Business case												E		
I.A2. Economic model / feasibility												D		
I.A3. Economic Incentives / barriers												E		
I.A4. Market/Product												D		
I.A5. Standards and practices												D		
I.A6. Operations												D		
I.A7. Tax and tariff												D		

Legend

Likelihood of Occurrence
5 = Very High chance and almost certain and expected to occur (90% or greater chance of occurrence)
4 = High chance and will probably occur in most circumstances (65% chance <90%)
3 = Medium chance and will occur in most circumstances (35% chance <65%)
2 = Low chance and unlikely to occur in most circumstances (10% chance <35%)
1 = Very Low probability and occurs in only exceptional circumstances (<10% chance)
NA = Not applicable to this project

Relative Impact
E = Extreme and would stop achievement of functional goals and objectives
D = Significant and would threaten goals and objectives; requires close management
C = Moderate and would necessitate significant adjustment to the overall function
B = Minor and would threaten an element of the function
A = Negligible and routine procedures sufficient to deal with the consequences

IPRA Tool

Critical Go/No-Go Decision Elements (n=44)

I.B.1 Sources & form of funding

I.A.1 Business case

I.A.2 Economic model/feasibility

II.B.2 Political stability

II.D.4 Contract type & procedures

II.B.3 Social unrest/violence

II.B.6 Relationship w/ government/owner

IPRA Tool

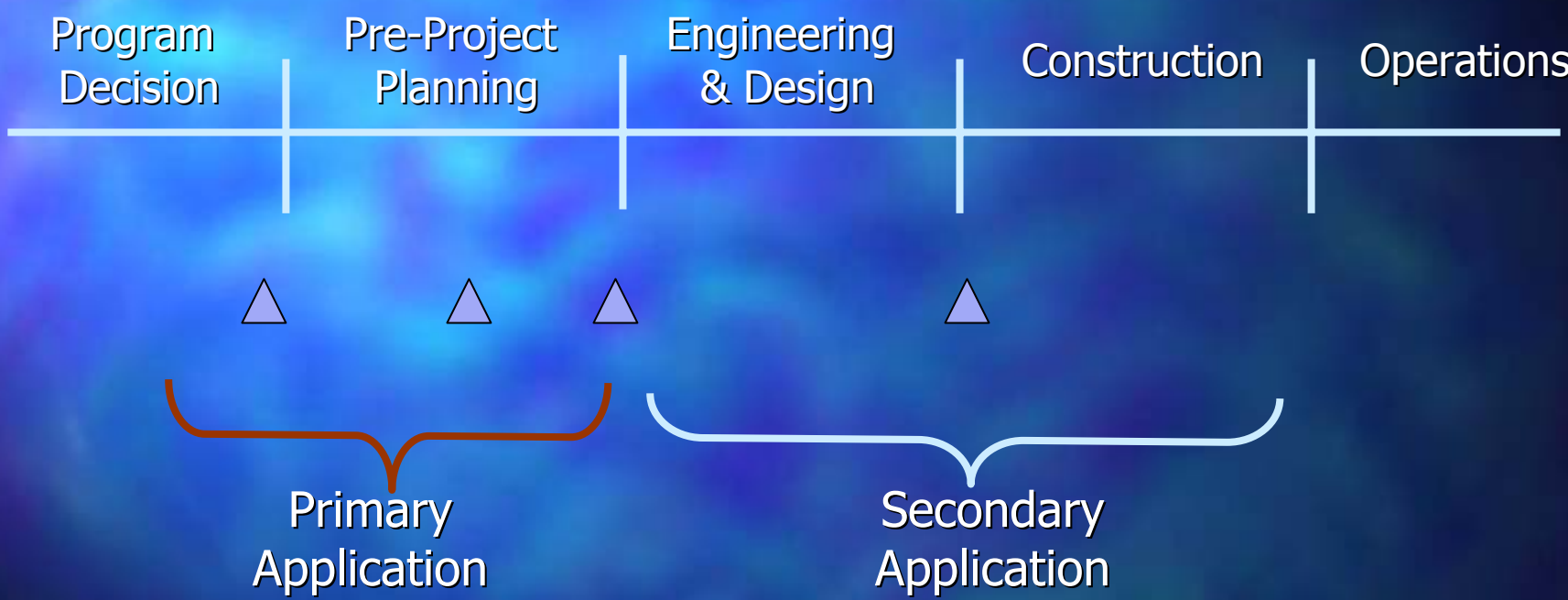
Most Common Extreme Risk Elements (n=36)

1. I.B1. Sources & form of funding
2. I.B3. Estimate uncertainty
3. I.A1. Business case
4. I.B4. Insurance
5. I.A2. Economic model / feasibility
6. I.B2. Currency
7. II.B6. Relationship with government/owner
8. I.A4. Market/Product
9. II.C1 Traditions and business practices
10. II.D4. Contract type and procedures

Using the IPRA

- Timing
- Participants
- Information Needs
- Process

Using the IPRA
Application Points - Timing



▲ = Recommended application points

Using the IPRA
Recommended Participants

- Project Management
- Key Disciplines Including Construction
- Technical Representatives
- Business Representatives Including Tax and Finance
- Production, Logistics and Operations
- Facilitator
- Project Sponsors

Using the IPRA
Information Needs

- Knowledgeable Participants
- Written Scope and Assumptions
- Project Information
- IPRA Descriptions and Assessment Sheets

Using the IPRA

Risk Assessment has two components:

- Likelihood of Occurrence
- Relative Impact of the event
- Combined, these two components frame the risk

Using the IPRA
Likelihood of Occurrence

Occurrence	Probability
NA - Not applicable to this project.	
1 - Very Low chance of occurrence; rare and occurs only in exceptional circumstances.	(<10% chance)
2 - Low chance and unlikely to occur in most circumstances.	(10% chance of occurrence <35%)
3 - Medium chance and possible to occur in most circumstances.	(35% chance of occurrence <65%)
4 - High chance of happening and will probably occur in most circumstances.	(65% chance of occurrence <90%)
5 - Very High chance of occurrence and almost certain and expected in most circumstances.	(90% or greater chance of occurrence)

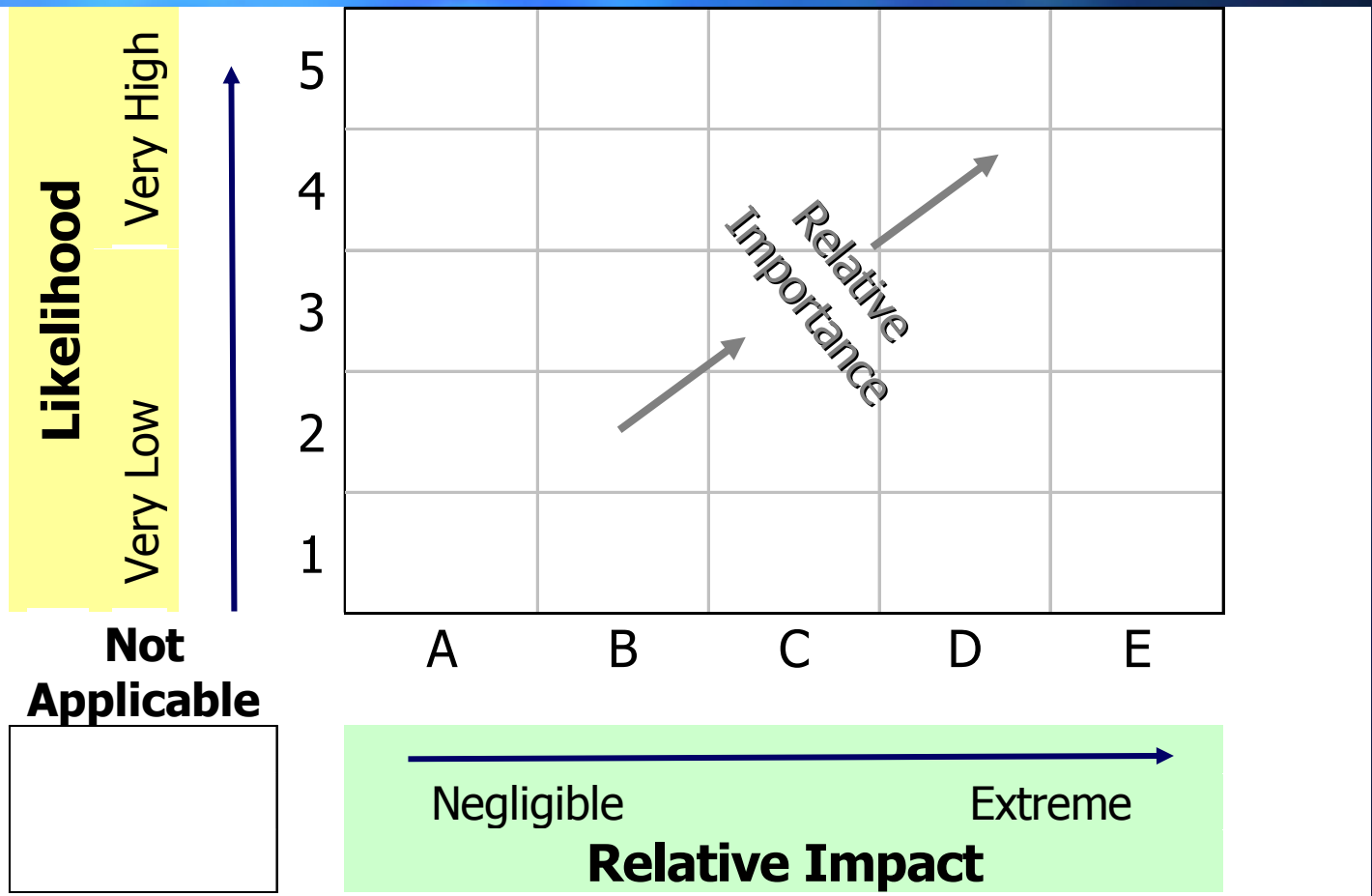
Using the IPRA

Relative Impact

RELATIVE IMPACT	
A	Negligible consequence that routine procedure would be sufficient to deal with the consequences.
B	Low consequence that would threaten an element of the project. Normal control and monitoring measures are sufficient.
C	Moderate consequence would necessitate significant adjustment to the project. Requires identification and control of all contributing factors by monitoring conditions and reassessment at project milestones.
D	Significant consequence that would threaten goals and objectives; requires close management. Could substantially delay the project schedule or significantly affect technical performance or costs, and requires a plan to handle.
E	Extreme consequence would stop achievement of project or organizational goals and objectives. Most likely to occur and prevent achievement of objectives, causing unacceptable cost overruns, schedule slippage, or project failure.

Using the IPRA

Risk Matrix



Using the IPRA

Assessment Depends on:

- Availability of information
- Experience and expertise of participants
- Understanding of issues creating risk
- Extent to which risks are stable or subject to change
- Reliability of assumptions

Using the IPRA
Application Process

- Description of each element
- Collect all available data to evaluate risk
- Select the Likelihood of Occurrence and Relative Impact level for each element
- Determine the Coordinates based on the levels selected
- Transfer the coordinates to the Risk Matrix to determine the Relative Importance of the Risk

IPRA Tool

Assessment Sheet Example

Risk Assessment Sheet--SECTION II--COUNTRY

CATEGORY	Likelihood of Occurrence (L)						Relative Impact (I)					Baseline	Coordinate L, R	Comments
		Very low →				Very High	Negligible →				Extreme			
	NA	1	2	3	4	5	A	B	C	D	E			
II.C. CULTURAL														
II.C1. Traditions and business practices												E		
II.C2. Public opinion												D		
II.C3. Religious differences												E		

IPRA Tool

Description Example

II.C2. Public Opinion

Public opinion about foreign firms or projects may result in complaints or active resistance. However, it is difficult to predict the level of opposition and impact of public resistance. An assessment needs to be made to understand the extent of adverse opinion. Proactive management of the issues may need to be performed. Issues of concern may include:

- Potential impact of local citizens and non-native international groups that could oppose the project because of environmental, social, or economic concerns
- Demonstrations and strikes
- Vandalism and civil strife
- Legal action
- Other

IPRA Tool

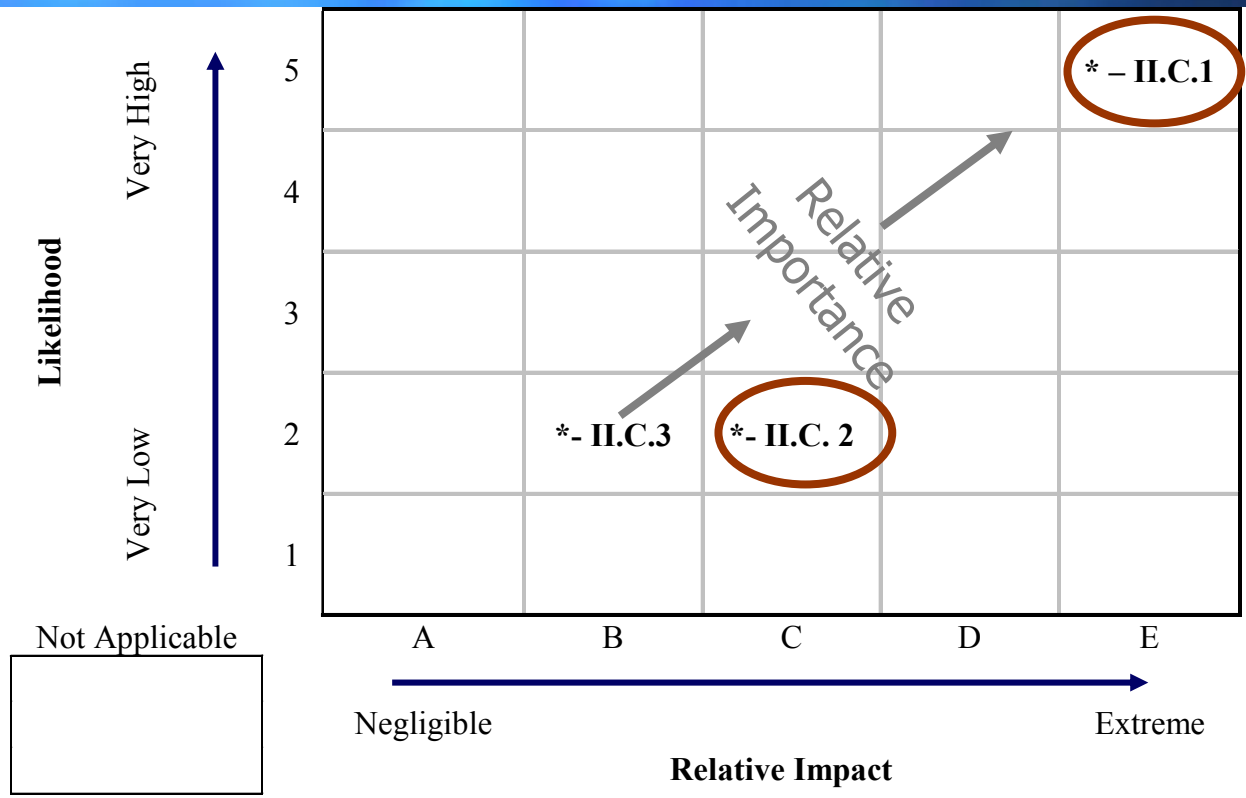
Assessment Sheet Example

Risk Assessment Sheet--SECTION II--COUNTRY

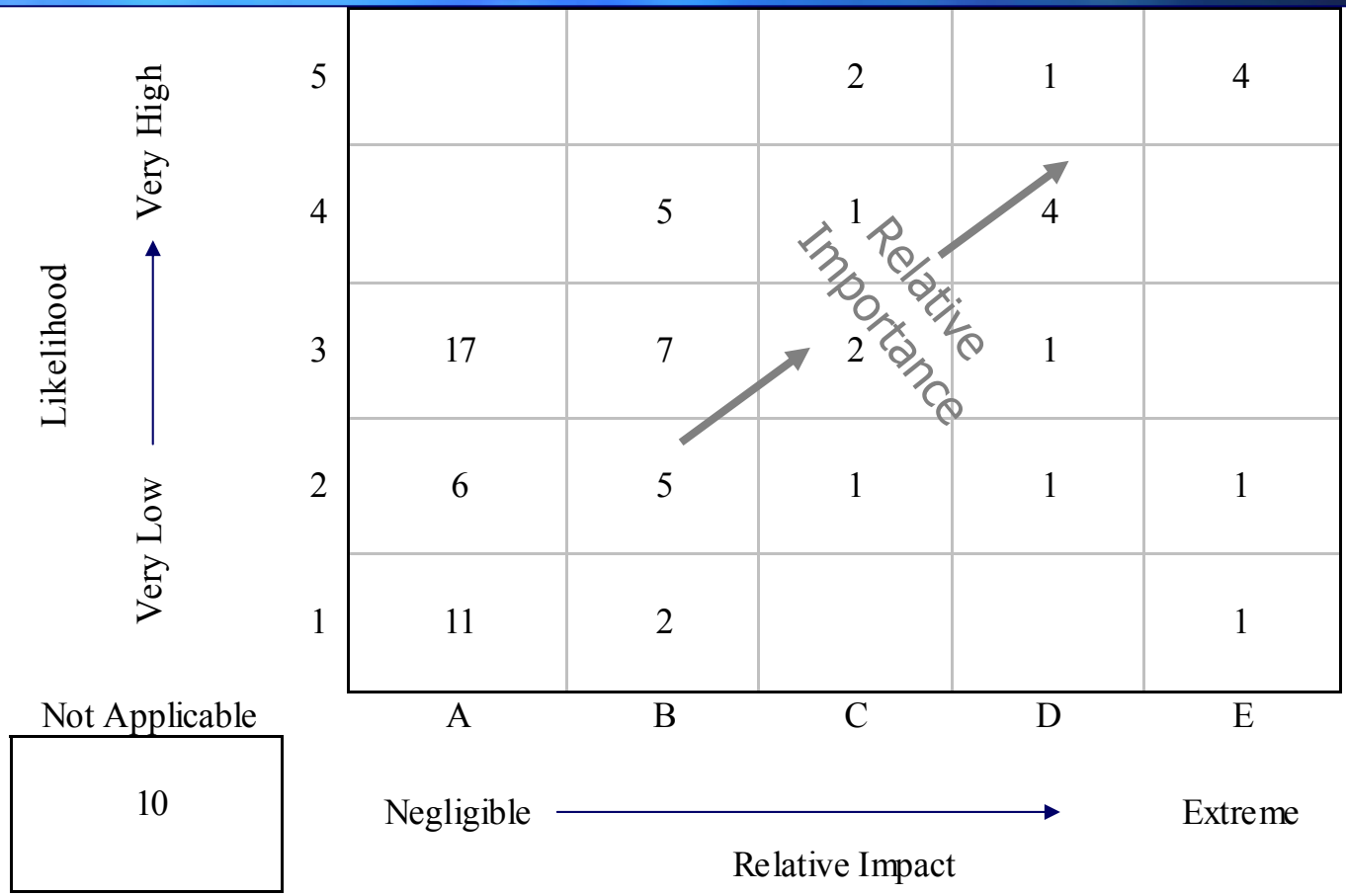
CATEGORY	Likelihood of Occurrence (L)						Relative Impact (R)					Baseline	Coordinate L, R	Comments
		Very low →				Very High	Negligible →				Extreme			
	NA	1	2	3	4	5	A	B	C	D	E			
II.C. CULTURAL														
II.C1. Traditions and business practices						✓					✓	E	5, E	
II.C2. Public opinion			✓						✓			D	2, C	
II.C3. Religious differences			✓					✓				E	2, B	

Relative Importance Chart

Risk Matrix



Example Completed Risk Matrix



What's Next?
After the IPRA - Users

- Mitigation
  - ✓ Avoidance
  - ✓ Retention/Acceptance
  - ✓ Control/Reduction
  - ✓ Transfer/Deflect
- Handling and Control
- Documentation

Project Application

IPRA Tool Testing on Real Projects

- Seven in-process
- Completed Projects
  - ✓Fifteen after-the-fact
  - ✓Approximately $145 capital at risk
- Eighteen countries
- TIC approximately $4.3 billion

Risk Issues

Problematic at Contract Formation

- Source and form of funding
- Business case
- Political stability, social unrest, and security
- Scope development process
- Estimate uncertainty
- Construction workforce availability and skill
- Construction schedule and quality

Risk Issues

Not Identified at Contract Formation

- Political stability, social unrest, and security
- Scope development process
- Construction workforce availability and skill
- Logistics, transportation, and warehousing
- Construction and operational safety
- Facility turnover
- VAT

Summary

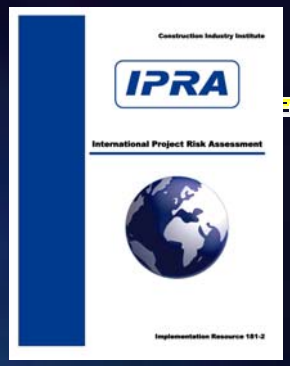
- IPRA process and documentation is comprehensive – no major gaps
- IPRA can be modified to fit specific practices/standards
- Extreme and severe risks are identified during assessment sessions

Summary (Cont'd)

- Establishes the basis for risk mitigation planning
- Track risks over time using risk register
- Multiple IPRA applications advisable
- Applicable to the full project life cycle
- Communicates/ aligns risk within the team and with the project stakeholders

Benefits of IPRA to Project Teams

- Identifies potential risks not typically considered.
- Rank orders potential risk areas.
- Insight into risk issues for entire project life cycle.
- Communicates risk within the team and with the project sponsors.
- Initiates the mitigation process.



Benefits of IPRA to Project Teams (continued)

- Provides a standardized risk evaluation process.
- Validated by significant owner and contractor input.
- Focuses on international project life cycle risk identification and assessment.

The Question

Can risks be systematically and effectively addressed on international projects, or is it folly to attempt this process?

Yes, we have identified international-specific risks, but….

Applicable to most business sectors

Questions / Answers

Additional Slides

Team Members

- Ellsworth F. Vines (Chair) - Dick Corporation
- Bretislav Borak - US Department of State
- Charles R. Domanico - Abbott Laboratories
- Michael Dinneen - Washington Group International
- G. Edward Gibson, Jr. - The University of Texas at Austin
- Yamile Jackson - Ringstones Consulting International
- Douglas J. Kaiser - EXXCEL Project Management
- Libby Lace - Jacobs Engineering Group
- Egon J. Larsen - Air Products and Chemicals
- Frank J. Mignoli - Kellogg Brown & Root
- Matthew Nixon - ConocoPhillips
- Corrie E. Reid - Aramco Services Company
- John Walewski - The University of Texas at Austin
- Guy Dudley - The University of Texas at Austin

Project Application

Project Description

- 110MW Combined Cycle Plant
- Auckland, New Zealand
- EPC Greenfield Site
- Duration: 20 months
- Cost: 107 MM $NZ (~68 MM $US)

Project Application
Most Significant Risks

- Safety During Construction
- Sourcing and Supply Logistics
- Local Contractor Limitations
- Environmental Permitting
- Time Difference

Project Application
Assessment Sheet

SECTION II – COUNTRY	Likelihood of Occurance						Relative Impact				
	NA	1	2	3	4	5	A	B	C	D	E
II.B. POLITICAL											
II.B5. Government participation & control						X	X				
II.D. LEGAL											
II.D5. Environmental permitting					X					X	

Project Application
Assessment Sheet

SECTION III – FACILITIES	Likelihood of Occurance						Relative Impact				
	NA	1	2	3	4	5	A	B	C	D	E
III.A. PROJECT SCOPE											
III.A7. Approvals, permits and licensing					X					X	
III.B. SOURCING AND SUPPLY											
III.B3. Subcontractors					X					X	
III.B4. Importing and customs					X				X		
III.B5. Logistics						X					X
III.C DESIGN/ENGINEERING											
III.C3. Local design services					X					X	

Project Application
Assessment Sheet

SECTION III – FACILITIES	Likelihood of Occurance						Relative Impact				
	NA	1	2	3	4	5	A	B	C	D	E
III.D. CONSTRUCTION											
III.D4. Construction delivery method						X				X	
III.D6. General contractor avaliability					X				X		
III.D10. Safety during construction						X					X
III.D11. Communication and data transfer						X			X		
III.E. START UP											
III.E1. Trained w orkforce					X					X	

Project Application
Assessment Sheet

SECTION IV – Production/Operations	Likelihood of Occurance						Relative Impact				
	NA	1	2	3	4	5	A	B	C	D	E
IV.C. TECHNICAL											
IV.C1. Logistics and warehousing						X				X	

Project Application
Mitigation Strategies

- Provided Extensive Safety Training
- Work Packages Were Structured to Maximize Skills of Local Contractors
- Sub-contractor Incentives
- Provided Schedule Flexibility for Construction Logistics
- Customs Inspectors at North American Factories
- Use of Local Consultants

Interview Participants

- Abbot Laboratories
- Air Products & Chemicals
- AON Risk Services
- Aramco Services
- Arthur Andersen
- Atkins Hanscomb Faithful & Gould
- Booze-Allan Hamilton
- Cadwalader, Wickersham, & Taft
- Chevron Texaco
- ConocoPhillips
- Dick Corporation
- Engineering Consulting International
- Enron
- Hooker Cockram
- Hong Kong Poly/REPM
- Jacobs Engineering Group
- Kellogg Brown and Root
- Kvaerner
- Marsh USA
- Washington Group International
- Parsons Brinkerhoff, Q&D
- Person & Craver LLP
- Rohm & Haas
- SMS-Demag
- World Bank

Weighting Workshop Participants

- Air Products & Chemicals
- Anheuser-Busch Companies
- Aramco Services
- Atkins Hanscomb
- BP America
- Carrillo Enterprises
- ConocoPhillips
- Dick Corporation
- Dow Chemical Company
- Engineering Consulting Int.
- EPC Commands
- Fluor Corporation
- General Motors Corporation
- Genuity Corporation
- Hatch Associates
- Hooker Cockram
- Interface Consulting International
- Jacobs Engineering Group
- Kellogg Brown and Root
- Kvaerner
- PMCC
- The Road Group
- Truenorth Corporation
- U.S. Department of State
- UEC Technologies
- US Filter Engineering and Construction
- Washington Group International