Fundamentals of Construction Contracts & Contractual Risk
The Sessions

• General Risks Management Processes & Appreciating Risks
• Design Obligations Risks
• Variations & Claims
• Time, Delays, EOTs & LAD Risks
• Claims Risks: Loss & Expense & Disruption
• Termination and Performance Bond Risks
• Dispute Resolution Risks
General Risks Management
Processes
Appreciating Risks
Differing Main Objectives

• Owner: Performance
  • Timely
  • Within or Under the Budgeted Cost
  • Satisfactory Design & Fit for Purpose
  • Performance Criteria Met

• Main-Contractor: Perform & Profit from Contract
  • Get the Contract: Compromise on Cost & Time?
  • Claims Orientated: Increase the Profit
  • Value Engineering and who keeps savings
  • Complete the Job and Reputation Intact?

• Sub-Contractor: Profit or Relationship?
Risks Allocations

- Owner should recognize
  - If more risk than what is fair is allocated to the contractor, the tender price will escalate
  - If tender price does not escalate, you better worry (the integrity of the contractor)
  - If more risk than what is fair is accepted by the contractor without tender price escalation, the contractor may go bust
  - If more risk than what is fair is allocated to the contractor, there will be delays, claims and problems at the site
  - Eventually the project and the owner will suffer
Risks Allocations

• Contractor should realize
  ▪ If tender price too high with too much contingency pricing, no award
  ▪ If you are claims driven note the standard form conditions of contract are better developed at ensuring the risk stays with you
  ▪ If you are claims driven note that the legal system is starting to recognize a higher standard of proof is required
  ▪ If you are claims driven note that a proper managed project will catch you out
  ▪ If you are claims driven note that you will have to bear the cash flow problem initially until recovery
Risks Management

• Identify your weaknesses and strengths related to the risk
• Where the strengths surmounts the weaknesses take on the risk
• If you are capable of controlling and shouldering the risk, assume the risk
• If you are able to influence the magnitude of the risk then you are able to minimize the risk, assume the risk (least cost risk bearer)
Risks Management

• Where you assume the risk, use it as a motivation towards managing the risk
• Where the risk can be transferred to 3rd parties, this should be the case
• Where the risk is wholly outside the parties’ control, then it should be shared
• If you have an overall objective which is imperative, assume as much risk as possible in order to achieve this overall objective
Sir Michael Latham

“no project is free of risk. Risk can be managed, minimized, shared, transferred or accepted. It cannot be ignored.”
Create a System

• Create a System soon!
• Surveys on good risks management: save up to 20% of cost exposure
• It has to become the company’s philosophy, attitude and procedure among all your key personnel from contract planning to contract estimating to contract management to contract close out
Tender & Risk Allocations

• Appreciating the various risks - before it is too late
• When is it too late?
• Owner - When the ink on the invitation to tender has dried up
• Contractor – When the ink on the bid document has dried up
Identifying Risks

- Identify the Risks Allocations in the Tender Documents
- Identify the Other Technical, Non-Technical, Commercial and External Risks
- Literatures & Research
- Senior and experienced personnel knowledge
- Company History
Identifying the Risks

- Form a task force of project knowledgeable stakeholders (consultants, experts and experienced personnel)
- Always involve the intended project team in the process
- Obtain as much literature and information on the intended project including site conditions, comparative studies of previous projects involving the parties, similar projects carried out by your organization and projects near the vicinity
The Intended Contract

• Commercial and Technical Terms
• Express Obligations and Duties for both Parties
• Risks Allocations between the Parties
• Claim Processes and Mechanisms
• Administrative Requirements
• Dispute Resolution
• Choice of Law
• Implied Terms
Risks Uncertainty

• Conditions of contract uses an imperfect tool i.e. language

• Ambiguity or uncertainty: contra proferentum will transfer the risk back to the Party that dictated the terms of Contract

• Conduct of the parties can switch the risk allocations
  ▪ The waiver principles
  ▪ The estoppel principles
  ▪ Luckily we do not have the good faith/reasonableness principles or do we?
Risks Planning

• Set up a workshop to identify and predict frequency and severity of the various risks
• Prioritize the risk based on your organization’s weaknesses
• Transfer Risks according to objective and Best Control Basis
• Draft working papers to be circulated to various experienced personnel in the organization for further comments or thoughts
Risks Planning

• Set up separate workshops to develop specific risk management, implementation plans
• Carry out contract administration and contract familiarization training for project team
• Try to maintain same personnel involved in negotiation on the contract during the construction period
### SIZE OF RISK – IMPACT GUIDE

<table>
<thead>
<tr>
<th>Severity</th>
<th>Possible Consequences</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insignificant</td>
<td>No impact</td>
<td></td>
</tr>
<tr>
<td><strong>Minor</strong></td>
<td>• Less Than 0.5% of total turnover financial impact</td>
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<tr>
<td></td>
<td>• No regulatory consequence</td>
<td></td>
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<tr>
<td></td>
<td>• Minor adverse publicity</td>
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</tr>
<tr>
<td></td>
<td>• Minor reversible injury</td>
<td></td>
</tr>
<tr>
<td><strong>Moderate</strong></td>
<td>• Financial loss up to 2% of total turnover in any year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Limited regulatory response</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Local adverse publicity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Major reversible injury</td>
<td></td>
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</tbody>
</table>
SIZE OF RISK – IMPACT GUIDE

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<tr>
<th>Severity</th>
<th>Possible Consequences</th>
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</tr>
</thead>
</table>
| Serious        | • Financial loss over 2 % of total turnover in 1 year & major savings programme required to break even in the medium term  
• Significant regulatory consequence  
• Negatives national press  
• Irreversible injury or death |          |
| Very Serious   | • Financial loss or loss of potential financial surplus over 2 % of turnover for consecutive years  
• Substantial regulatory consequences  
• Sustained negative national press  
• Major sanctions  
• Closure of major part of business  
• Irreversible multiple injury or death |          |
RISK MANAGEMENT USING TECHNOLOGY
Risk Analysis Software :-

• Primavera Monte Carlo
• Pertmaster Project Risk / Risk Expert
• Intaver Risky Project
• Palisade @RISK for Project
• Crystal Ball
• Projistic & etc.
Common Techniques Used In Software:–

• Monte Carlo Simulation
• Latin Hypercube Sampling
• Petri Net Simulation
• What-If Approach
• PERT Approach
• Probability Distribution & etc.
Capability of Risk Analysis Software:

- Estimation of the success rate of finishing project on time and within budget
- Determination of crucial tasks with most risk exposure and most likely to delay project
Capability of Risk Analysis Software:

- Estimation of the chances of finishing project by a certain date
- Estimation of how much the project likely to cost after incorporating the risk mitigation measures
Benefits of Risk Analysis Software:

- Functionality and usability for all levels
- Save time and effort
- A comprehensive risk database can be built for future projects reference
- Results presented in templates and charts for professional and straightforward reporting
Results for: Entire Plan

<table>
<thead>
<tr>
<th>Percent</th>
<th>Scenario C</th>
<th>Scenario B</th>
<th>Scenario A</th>
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<tbody>
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<td>90%</td>
<td>26 Aug 2006 17:00</td>
<td>20 Aug 2006 17:00</td>
<td>31 Jul 2006 17:00</td>
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<td>80%</td>
<td>24 Aug 2006 17:00</td>
<td>24 Aug 2006 17:00</td>
<td>27 Jul 2006 17:00</td>
</tr>
<tr>
<td>70%</td>
<td>22 Aug 2006 17:00</td>
<td>22 Aug 2006 17:00</td>
<td>27 Jul 2006 17:00</td>
</tr>
<tr>
<td>60%</td>
<td>20 Aug 2006 17:00</td>
<td>21 Aug 2006 17:00</td>
<td>20 Jul 2006 17:00</td>
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<tr>
<td>50%</td>
<td>17 Aug 2006 17:00</td>
<td>20 Aug 2006 17:00</td>
<td>20 Jul 2006 17:00</td>
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<tr>
<td>40%</td>
<td>15 Aug 2006 17:00</td>
<td>17 Aug 2006 17:00</td>
<td>24 Jul 2006 17:00</td>
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<tr>
<td>30%</td>
<td>14 Aug 2006 17:00</td>
<td>16 Aug 2006 17:00</td>
<td>24 Jul 2006 17:00</td>
</tr>
<tr>
<td>20%</td>
<td>10 Aug 2006 17:00</td>
<td>15 Aug 2006 17:00</td>
<td>23 Jul 2006 17:00</td>
</tr>
<tr>
<td>10%</td>
<td>07 Aug 2006 17:00</td>
<td>13 Aug 2006 17:00</td>
<td>20 Jul 2006 17:00</td>
</tr>
</tbody>
</table>
External Risks

• Host Country or Location of Project
  – Political Risks
  – Logistics
    • Access
    • Support: Labour & Materials & Sub-Contractors
  – Working Environment
  – Legislative & Authority Requirement
Political Risks

- Political & Social Economic Condition Changes & Political Instability
- Creeping Expropriation of Assets with evolving tax, labour, environmental and socio economic measures
- Outright Expropriation of Assets
- Culture of Breach of Contracts
- Protectionist Legal Systems
- Currency Inconvertibility
- Economic Restrictions & Sanctions
Management of Political Risks

- Joint venture with national concessionaire
- Joint venture with strategic investor
- International financing by multilateral institutions – IFC or IIC
- Developing good relationship with local workforce
- Establishing sound local reputation & corporate image (using CSR)
Treaty Protection

• Bilateral or Multilateral Investment or Free Trade Agreements with Investment chapters
• Investor from Member Countries Protected
• Protections Can Include:-
  National Treatment, Most Favoured Nation Treatment, Public Interest Expropriations + Compensation Including Creeping Expropriation, Freedom to Repatriate or Transfer Funds & Capital, Fair & Equitable Treatment & Full Protection and Security
Arbitration against State

- Arbitration
  - ICSID Convention
  - ICSID Additional Facility Rules
  - UNICITRAL Arbitration Rules
  - Enforcement: New York Convention
  - Adoption of Model ICSID Law
  - ASEAN Protocol on Enhanced Dispute Settlement Mechanism (Jakarta Protocol)

- Using Public International Law > Private Law
Legal Risks

• Choices of Law
  – Substantive Law Governing Relationship
    \textit{(Lex Causae or Lex Contractus)}
  – Jurisdictional Law Governing Forum of Dispute Resolution
    \textit{(Lex Arbitri)}
  – Procedural Law Governing Procedure Applicable to the Dispute Resolution Process
  – Law/Rules Applicable when there is a Conflict of Laws \textit{(Lex Loci)}

• Changes in the laws
• Familiarity legal & industry standards on EPC contract
• Unclear Contract Terms & Drafting Language
Legal Risks Mitigation

- Align Standards to International Standards
  - corporate governance, environmental, safety & health etc;
- Implement & Enforce: Appropriate Compliance System
- Create Culture of Compliance with Employees
- Have an Experienced In-House Legal Team
- Have an Extensive Legal Affairs Know-how Resource
- Seek Advice from Specialist External Resource
Risk Handling

• Managing the risk – what does this involve?
  ▪ Records on the events that lead up to the risk occurring
  ▪ Putting your mind to corrective, preventive and handling methods in the risk allocation process
  ▪ Identifying the occurrence of the risk event as soon as it arises
  ▪ Putting into place mitigation plans
  ▪ Setting up a system that can gauge the effects of the risk event – record the costs and time impact
  ▪ Trying to resolve the outcome of the risk event in an amicable manner
  ▪ Protect contractual and legal rights at all times
Risk Management

• Do the contract conditions clearly and precisely set out who is responsible for the various risks?
• For the benefit of the project, are there any mitigation methods to avoid or reduce the effects of various risk events?
• Can the effects of the risk event be conclusively proven or disproven?
• Is there an effective forum where any disputes on the risk allocation and the effects of the risk can be resolved?
Documenting the Cause

• Pre-tender
  – Clarifications
  – minutes of meetings
  – design and technical representations
  – design and technical requirements/briefs
  – amendments to tender documents
  – tabulate all information given
  – chronologies the tabulations and identify what has been superseded
Documenting the Cause

- Pre-award
  - Tender questionnaires and clarifications
  - Clarity on what are superseded clarifications and representations
  - Tabulate changes negotiated and agreed by parties
  - Rate-loading and rationalisation (for contract or schedule of rates for variation)
  - Pre-award/kick off minutes of meeting
Documenting the Cause

• Contract Execution and Administration
  – Design Process: tabulate the design briefs and proposals, identify those that are superseded, record the design evolution and reasons, tabulate the preliminary drawings and those that are superseded, capture all changes introduced, monitor deadlines and response time, ask for more information and clarifications before approvals, identify discrepancies and clarify, shop drawings
Documenting the Cause

- Time: Identify the milestones and scheduled turnover, check the logic of the baseline schedule including the CPN and floats, identify the coordination requirements and resource allocations, approved baseline schedule, monitor the schedule, update the schedule, record events that likely to lead to delay or disruption, monitor the events and its impact on the schedule or resources, notify immediately once event has caused delay or disruption, if unsure just notify, record the impact during period of impact, create impacted time and resource schedule, make claims within time
Documenting the Cause

• Variations: Identify the change and the documents that establish the change such as the Employer’s Requirements or Needs Statement or Tender Drawings or Construction Drawings Rev.0 as compared to the instrument introducing the change, identify the instruction to carry out change such as memo, site meetings, response to RFI, oral (with written confirmation) etc, record request for variation order and reservation of right to claim if no VO, record the impact of the change in terms of resources & time, record the effect of change on completed or partially completed works, make claim
Pix Protocol

- Project Information Exchange (PIX)
- Electronic Data Interchange Agreement
- Agreeing on a Pix Protocol covering:
  - Client’s Information Needs: Fixed Formats & Timing
  - Electronic Information: Agreed Formats & Rules of Usage
  - Design: drawing origins, coordination formats
  - Document Management: File naming & numbering systems
  - CAD modeling protocols & principles
  - Project Communications: E-Mails Distribution Policies
PIX Protocol?

- The differences that cause the delays, red-tape & disputes:-
  - Information transfer
  - Information handling
  - Chain of scrutiny & approvals
  - Sharing and re-use of information
  - Trust & Reducing Team Conflicts
Risk Handling

• Preventive measures – Measures to avoid, abate and reduce the chances of the risk occurring
• Corrective measures – Measures to mitigate the risk by either avoiding the effects of the risk or limiting the consequences of the risk
• Handling the risk – How to ensure that you only bear the proper consequences of the risk and prevent the consequences leading to further consequential losses or damage
Risk Handling

• Checklist derived from the risk allocation in the Contract and by law
• Contain the categories that focus the minds on the important elements of seriousness of effect and the risk preventive, corrective and handling measures
• Checklist can contain any amount of categories of concern and steps, it is up to you
• Updated based on experience and lessons learnt
## Risk Handling

### Risk Analysis Checklist

<table>
<thead>
<tr>
<th>No.</th>
<th>Risk</th>
<th>Cause / Weaknesses</th>
<th>Effect</th>
<th>Potential Measures</th>
<th>Allocation</th>
<th>Risk Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Managing Contractor</td>
<td>Overlaps or gaps between the scope of works of various local subcontractors (SC)</td>
<td>Cost consequences to be borne by MC</td>
<td>Preventive: Prepare clear and unambiguous subcontract &amp; RFI's</td>
<td>Corrective: Variation orders (VO)</td>
<td>Allocation: MC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Main contract uncertainty</td>
</tr>
<tr>
<td>2</td>
<td>Safety</td>
<td>Lack of awareness by SC, loss of reputation</td>
<td>Accidents, delays, fines / termination</td>
<td>Preventive: Good insurance policy</td>
<td>Corrective: Backcharge SC</td>
<td>Allocation: SC (direct costs) / MC (delays)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Strict control on SC -</td>
<td>- Replace personnel / SC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Contract clearly drafted</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Joint safety training for SC</td>
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</table>
Own Implementation Risks

• **Project Team – the Personnel**
  – retention of the appropriate personnel from the Feasibility Team/Tender Team
  • awareness of time constraints, funds and resource requirements
  – competent, productive & efficient personnel: middle management
  – experience > qualification, training & education
  – exposure to global standards & new innovative management methods
  – use work teams: positive synergy through coordinated efforts
Own Implementation Risks

- **Project Team – the Personnel**
  - allow freedom & autonomy,
  - utilise different skills & talents,
  - allow completion of whole & identifiable & important / critical task,
  - have the right personalities & size of team, provide adequate resources and leadership,
  - have the appropriate performance evaluation and create team goals & efficacy
  - motivation: financial, security of tenure, reputation
  - simplify lines of communication
  - encourage appointment of technical consultants
Own Implementation Risks

- Is the Company Procurement ISO Standards in place & modified to suit the situation & Host Country policies?
- Have the Procurement Department processes and procedures been developed and ready for:-
  - Bid Preparation & Issue
  - Bid Evaluation & Issue
  - Purchasing & Contract Negotiations
  - Receiving, Quality Control & Inspections (Factory & Site)
  - Expediting
  - Tracking
  - Document Control
  - Shipping
  - Rejection & Re-supply
  - Cost Management
Own Implementation Risks

- Are the Procurement Team personnel hired, briefed, and in place?
- Is there a cost effective & economic plan for the procurement, logistics, utilisation of field based warehouse facilities and lay-down areas, in place?
- Have the procurement plans identified the key equipment, materials and service provider or supplier contract required?
- Have the lead times for orders & purchases and delivery been coordinated with the CPM program?
- Have all the technical equipment suppliers been confirmed as to the delivery time frames required?
Own Implementation Risks

- Have the key equipment vendor’s value engineering & designs been confirmed and agreed or is it sufficiently developed that it is likely to be finalised and ready for delivery by the required dates?
- Are the local vendors able to deliver the quality and quantity of materials & equipment required?
- Is there a need to source other potential vendors & suppliers?
- Are there alternative suppliers who can be used in event of delay or lack of supply?
- Are all vendors & suppliers informed of the material rejection & re-supply procedures & processes?
Own Implementation Risks

- Ensure compliance with pre-commencement plans but flexibility to alter & modify to suit situation
- Monitor & Improve on-going services of vendors on cost, quality & delivery
- Coordinate & optimize the tender, evaluation, negotiation & awarding processes
- Close liaison with all vendors & technical equipment suppliers on performance & payments
- Monitor procurement and logistics process for time and cost optimization
- Optimize the QA/QC equipment and material inspection processes
- Expedite all required and outstanding purchase service orders
Own Implementation Risks

- Make available all procurement tracking information with construction & fabrication departments for coordination
- Flexible & quick lines of communication
- Liaison with alternate vendors or service suppliers as a contingency strategy
- Monitor and optimize inventory carrying cost
- Monitor and zero optimize material and component obsolesces
- Beware of consumables, wastage & on-shelf expiry
- Constant reporting from middle management to top management
- Internal Procurement Group Audits
Own Implementation Risks

- Have all the necessary licenses /permits been procured? - onus on Employer or IJM?
- Are there any site access issues or encumbrances or obstruction?
- Are all the infrastructure and utilities arranged for the site?
- Are all Authority requirements for fabrication & erection in place?
- Is the detailed CPM program/schedule and manpower schedules finalised and ready?
- Are all or the CP design construction or erection drawings (isometrics etc) available?
Own Implementation Risks

• Are the lay-down yards & fabricators yards sufficient and ready?
• Are all the CP sub-contractors awarded and ready for commencement and to perform based on the CPM program?
• Have the labour sub-contractors sourced the required manpower & skilled manpower based on the planned manpower schedule?
• Are all the required supervisory & QA/QC management staff appointed or arranged for secondment at the required periods?
Own Implementation Risks

- Fast Track Planning – Is it Possible?
- Are drawings developed and prepared and issued ahead of schedule of each area or item of work?
- Are the drawings coordinated?
- Are coordination meetings being held periodically and whenever required?
- Is there an adequate CM Team?
- Are there adequate & constant supervision & QA/QC inspection?
- When defective work is detected, is there an immediate action requiring the performance of corrective works?
Own Implementation Risks

• Is there a general availability & adequacy of manpower for the differing works within the localised area or the host country?
• Are adequate skilled workers available within the localised area or the host country such as specialist fabricators, welders, erectors, machinist, engineers etc?
• What steps have been taken to source and obtain foreign skilled or unskilled manpower and have their work permit issues with the Government been handled and resolved
• What specialised training is offered to workers for special areas of work and how are these workers learning curves been gauged?
Own Implementation Risks

- What is done to maintain the trained & experienced Workers?
- Safety Induction Courses, Tool Box Meetings, Active Safety Officers, Incentive & Disincentive Schemes, Whistle-Blower to Middle Management Encouragement
- Scheduling & Re-scheduling all Aspect of Works
- Coordinated Scheduling of various Works
- Time, Access & Integration Coordination between sub-contractors
- Time Coordination between suppliers, fabricators & sub-contractors
- Availability & Access within and between the lay-down, fabrication and installation areas
- Mitigation & Problem Solving Meetings
- Shop drawing monitoring
The End

Q & A