Risk Allocation in Construction Contracting

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Sources of Construction Contract Risk

Construction Contracts will generally need to identify and assign risks in the following areas:

- **Project Execution**
  - Quality
  - Schedule
  - Cost
- **Financial Factors**
  - Escalation
  - Foreign exchange
  - Cost of money
- **"Market" Factors**
  - Supply – demand in local and global pricing as distinct from escalation
- **Regulatory Factors**

Increased Contract Risk in the Nuclear Industry

The contract risks are compounded in the nuclear industry:

- Extremely long project durations – typically 10 years
  - 3 year licensing period before substantial construction starts
  - 10 year exposure to escalation and foreign currency fluctuation
- Limited number of qualified suppliers of critical commodities and equipment
  - Demand driven pricing out of step with inflation/escalation
- Nuclear Regulatory Environment
  - Interpretation and application of EA, site license and CNSC requirements
  - Regulatory requirement for Owner/ Operator intervention in design process

Contract Risk Allocation is Critical

With the magnitude of Nuclear plant costs and potential steep cost escalation contract risk allocation must:

- Allocate the risk factor to the party best able to manage the risk
  - Excessive contractor risk will result in un-economic levels of contingency and risk costs
  - Excessive owner risk may make the project un-financeable
- Balance risk allocation to ensure alignment between the Owner and Contractor on project objectives
- Reflect the reality of the regulatory environment and associated impact on project scope and schedule

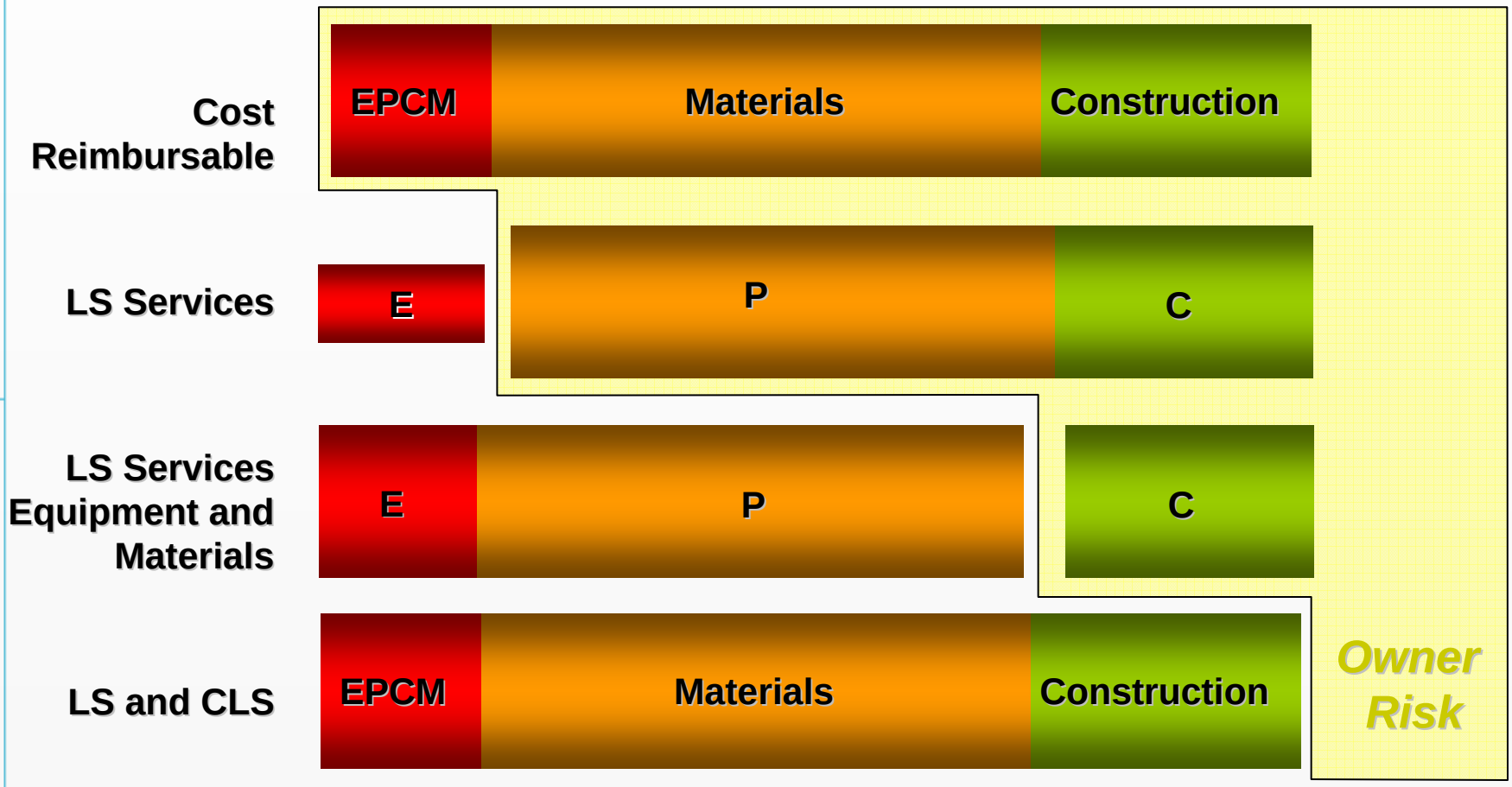
Different Contracting Methodologies
Different Risk Allocation

- EPC Reimbursable with a Mark-up on the total TIC
- Lump Sum(LS) for some aspects of E or P or both
- LS for full EPC
- LS from FEED estimate for the complete project

or

Converted Lump Sum (**CLS**) from FEED

Who has the risk ?



RISK ALLOCATION OPTIONS

Cost Reimbursable

+ Advantages

Owner

- Maximum flexibility on project scope and schedule
- Avoids excessive contingency and risk in contractor's hands
- Avoids confrontational change order environment

Contractor

- Minimal risk exposure and certainty of cost recovery
- Predictable revenues and earnings

-Disadvantages

Owner

- Full risk exposure
- Lack of cost certainty until late stages of project
- Limits financing options

Contractor

- Low margin and low value-added work
- Competitive bidding shaving margins further

Lump Sum EPC

+ Advantages

Owner

- Early cost certainty
- Minimizes owner risk
- Flexible financing options

Contractor

- High margins commensurate with the risk
- Reduced competition due to limited number of contractors who can assume the risk
- Avoids Owner intervention in project execution

-Disadvantages

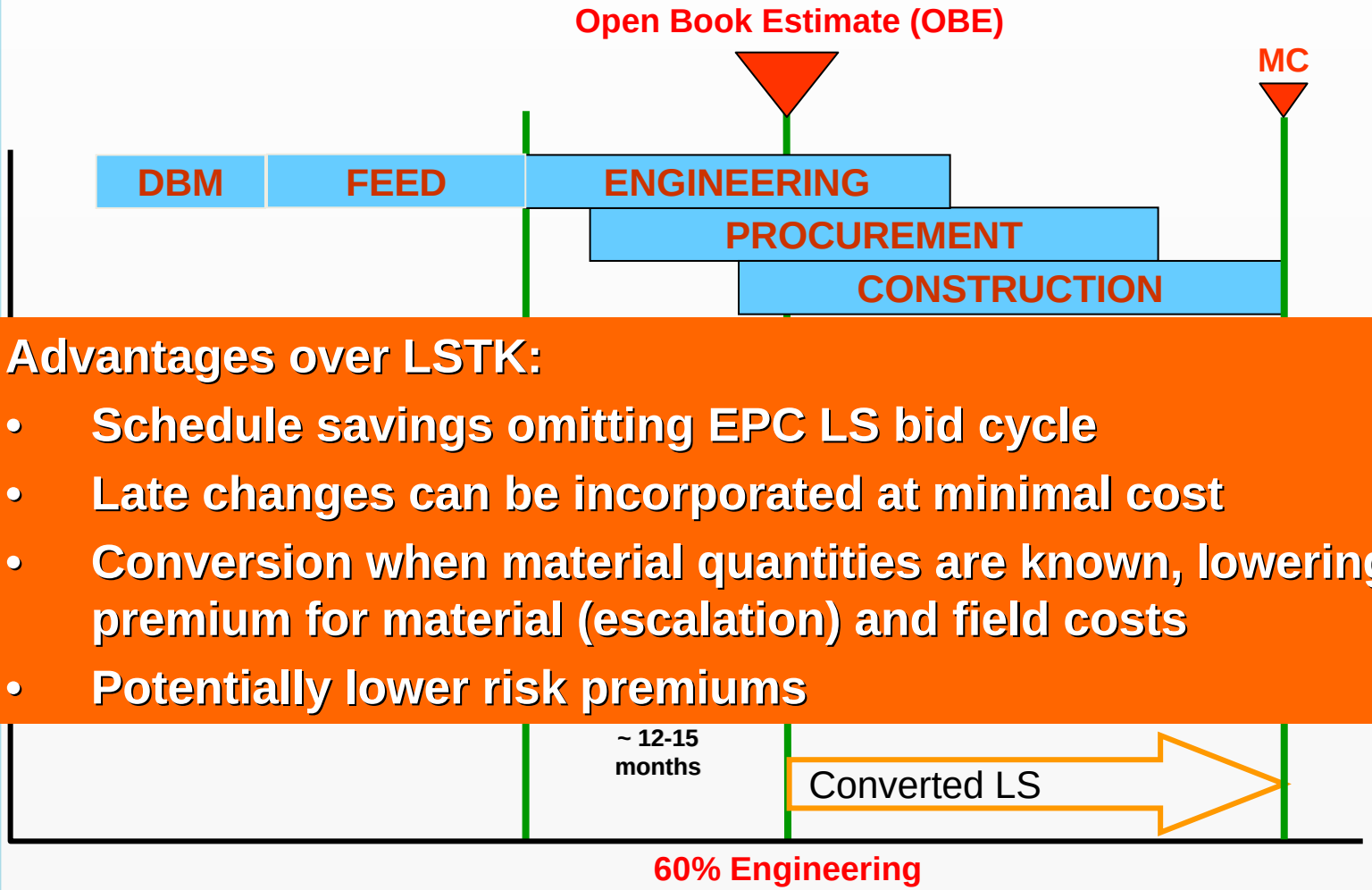
Owner

- Premium cost due to contractor's contingency and risk
- Limited ability to make design changes without onerous change order process
- Limited ability to intervene or influence the contractor's project execution performance

Contractor

- Maximum risk strategy
- Exposure to market demand and escalation which is difficult to predict and outside of the contractor's control

Converted Lump Sum – CLS Model



Advantages over LSTK:

- **Schedule savings omitting EPC LS bid cycle**
- **Late changes can be incorporated at minimal cost**
- **Conversion when material quantities are known, lowering risk premium for material (escalation) and field costs**
- **Potentially lower risk premiums**

Converted Lump Sum – Staged Contract Approach

The converted lump sum or staged contract approach is well suited to the nuclear industry:

- Takes advantage of the 3 year licensing period to complete a majority of engineering so that material quantities are known and equipment pricing is firm
- Allows the Owner flexibility during the licensing period to implement design changes necessitated by regulatory requirements
- Shortens the forward window on construction to 5-6 years allowing more confidence in escalation forecasts and pricing
- If some scopes are still undefined at conversion, leave them as T&M until adequate scoping is done

CONCLUSION

•Successful “Fast Track” projects don’t exist

•“ABC” of projects;

- FEED
- Engineering
- Procurement
- Construction

DON’T CHANGE THE SEQUENCE OF THOSE ACTIVITIES!!!

•Planning
•Alignment of interest

Thank You