Aalto University
School of Chemical
Engineering

CHEM-E0115 Planning and Execution of a Biorefinery Investment Project (5 cr)

Lecture 3:
Investment Implementation Phase – Project Controls:
Risk, Contract, Change and Claim Management

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Agenda

Introduction

1. Project Functions

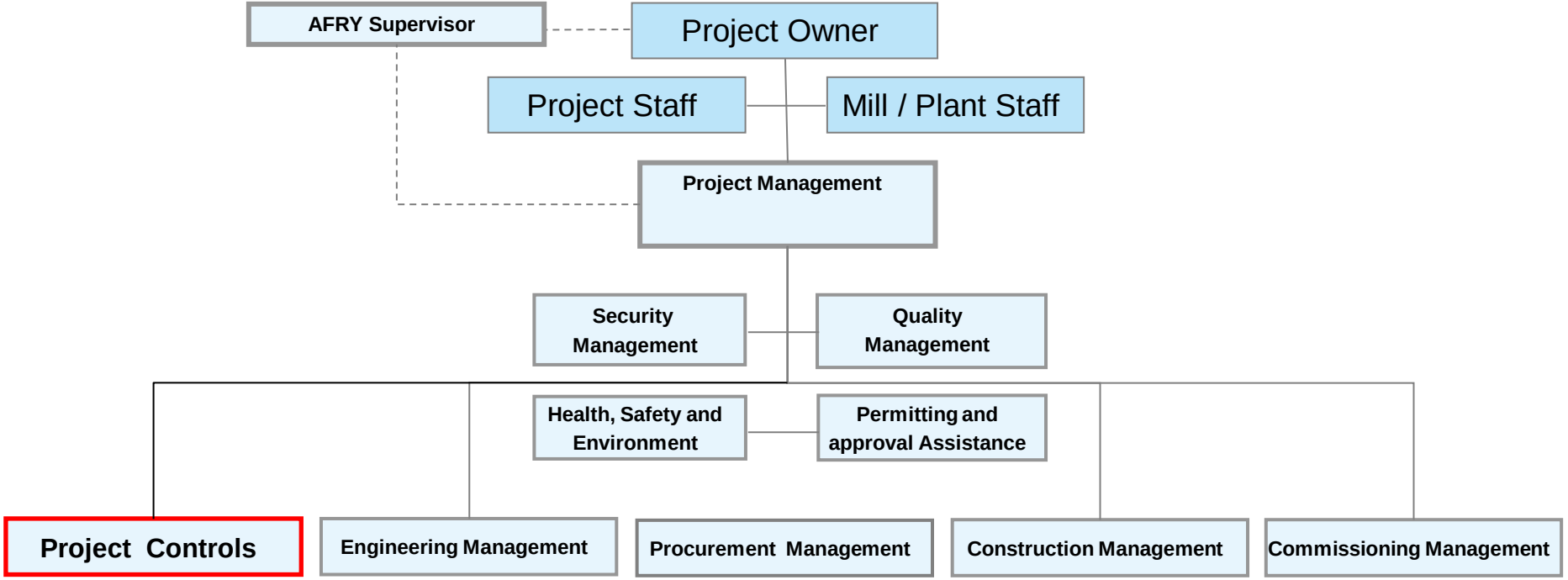
2. Risk Management

3. Contract Management:

- **Administration,**
- **Change Management and**
- **Claim Management**

1. Project Functions

Project Functions



Time Management

Cost Management

Resource Management

Project Risk Management

Contract Management

- Administration
- Change Management
- Claim Management

2. Risk Management

Risk Management

What "risk" means?

"A situation involving exposure to danger"

There is a difference between the "risk" and "cause"

Risk Management

Risk analysis

- There are formal methods used to "measure" risk
- Often the probability of a negative event is estimated by using the frequency of past similar events
- Risk is often measured as the expected value of an undesirable outcome. This combines the probabilities of various possible events and some assessment of the corresponding harm into a single value.

$$R = (probability\ of\ accident\ occurring) \times (expected\ loss\ in\ case\ of\ accident)$$

$$R = \sum_{for\ all\ accidents} [(probability\ of\ accident\ occurring) \times (expected\ loss\ in\ case\ of\ accident)]$$

Risk Management

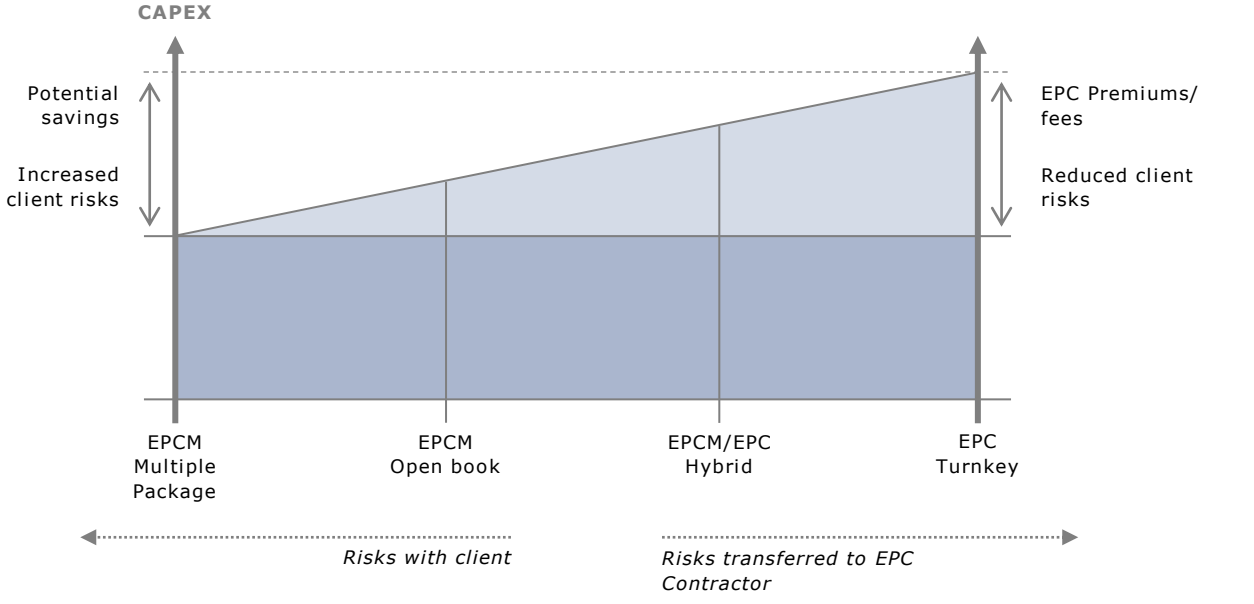
Work Processes	Tasks	Deliverables
Project Risk Management	Risk register development	• **Risk review report (first)** - Risk review basis - Risk register and action plan - Risk map
	Risk register monitoring	• **Risk review report (continuation)** - Risk register and action plan - Risk evolution charts

Risk Management

- Preparing for unexpected events during the project
  - Facilitates decision making in different project phases
  - Awareness of threats to project objectives
  - Inform management, transparency
  - Protects budget, schedule, and quality (safety and environment)
  - Understand challenges and their dimensions in a similar/realistic way – consensus

- Qualitative and quantitative methods
  - Ranking – high, med, low - qualitative
  - % and €, statistical analysis - quantitative

Who Carries the Risk (ref. also Lecture 2)

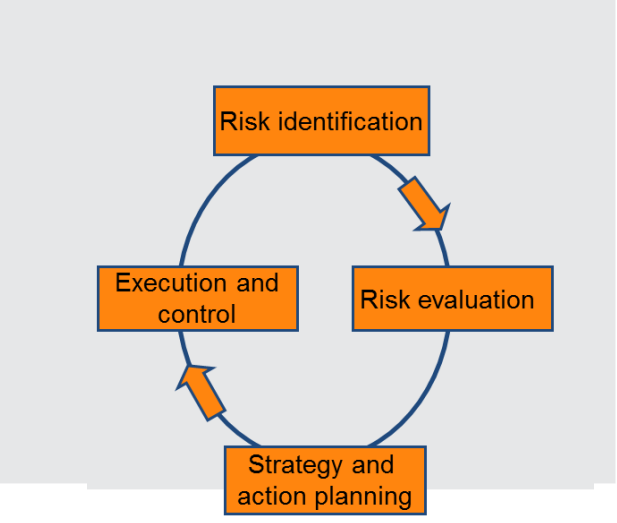


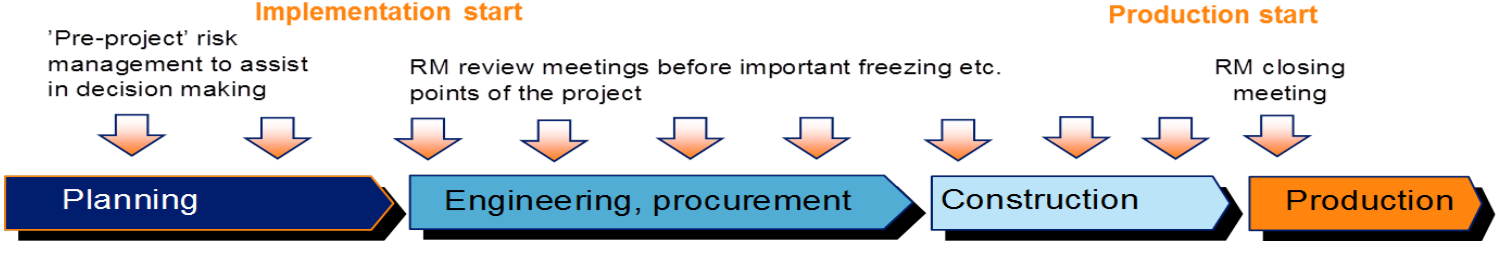
Full freedom for equipment & sub-contractor selection

Limited freedom for equipment & sub-contractor selection

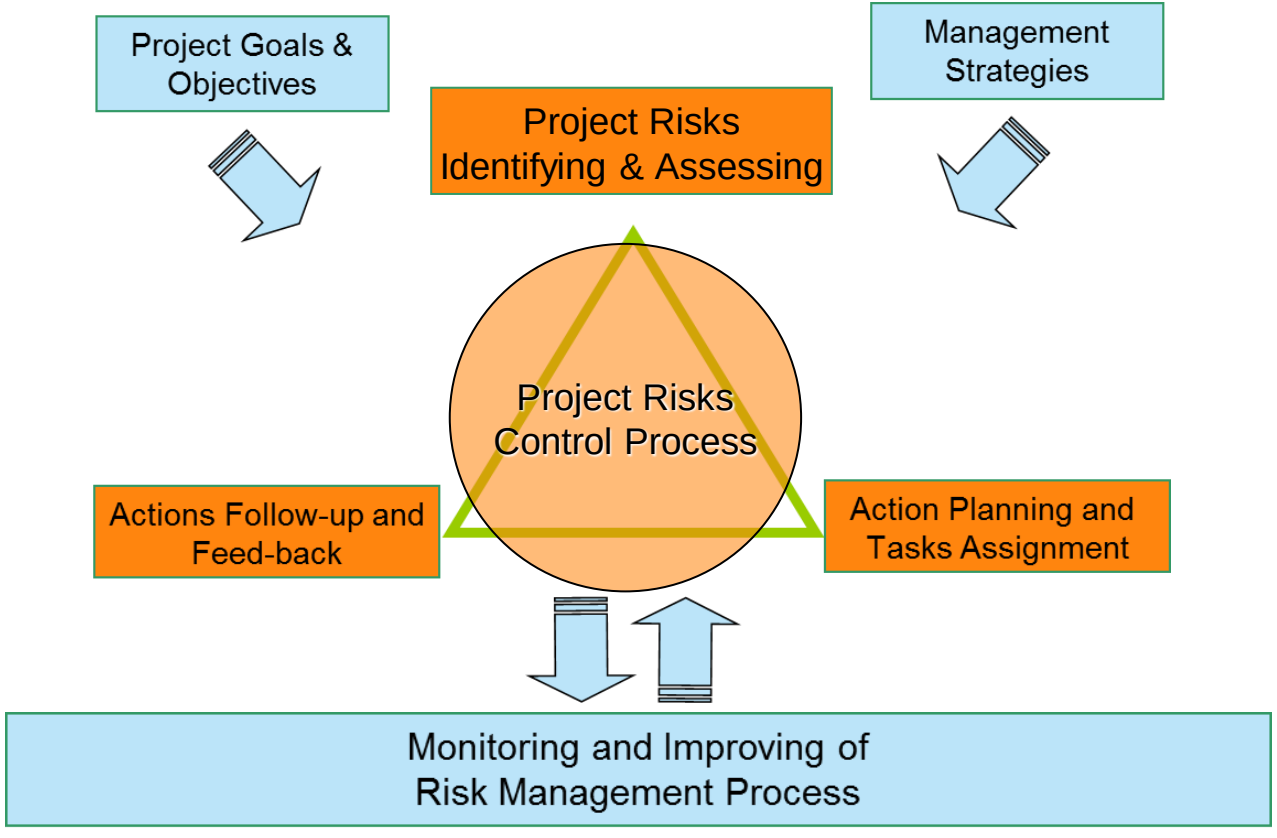
Risk Management Process

- **Definition** of the risk management scope
- **Identifying** risks with assistance of a knowledge browser
- **Evaluating** the risks, defining probability (%) and impact (€)
- Defining **strategy** (tolerance level for risks)
- **Action planning** (defining eliminating and mitigating actions, evaluating the effect of actions on the risks)
- **Execution and Control** (reporting, monitoring and feedback, trend analysis)





Risk register development and monitoring

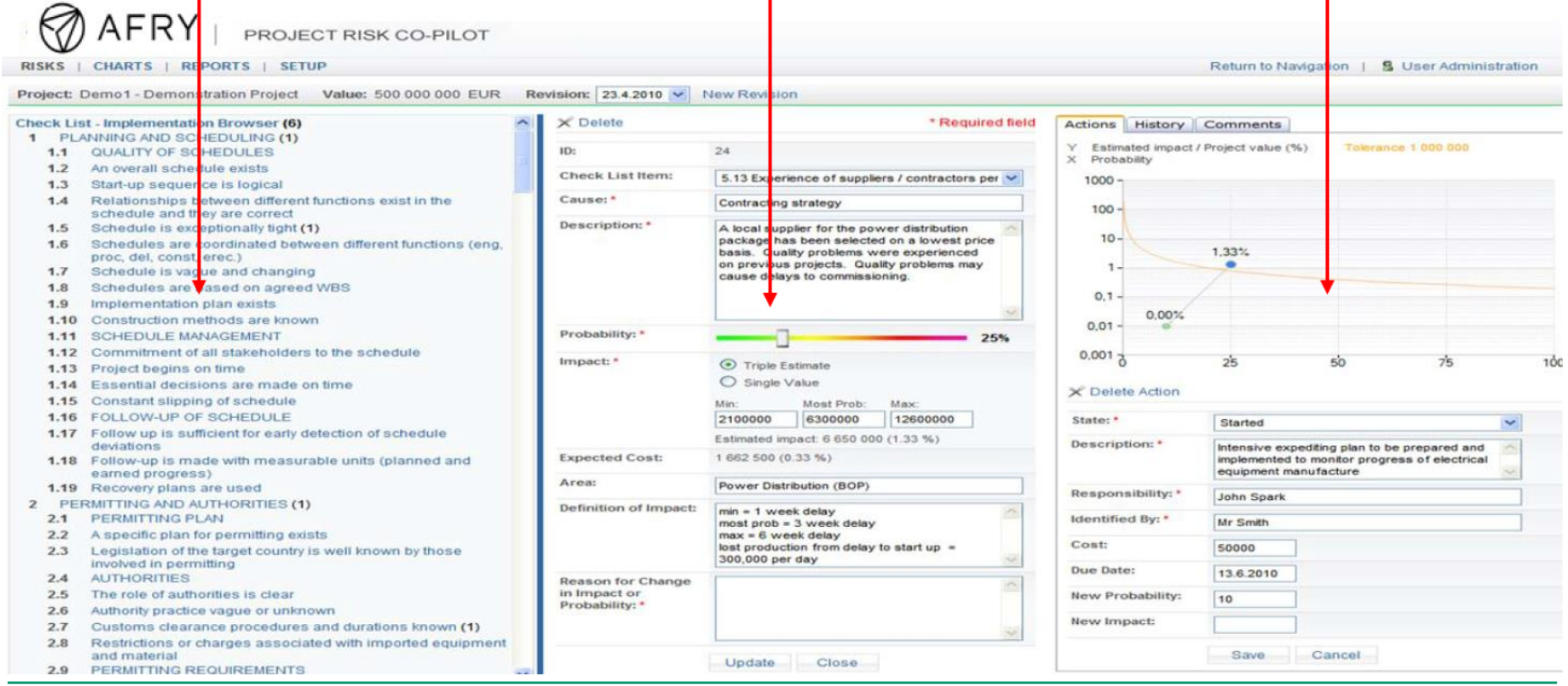


Risk Management - Co-Pilot™ - application

Knowledge Browser for risk identification

Definition, analysis and evaluation

Strategy and action planning



Risk Management - Co-Pilot™ - application

Strategy and results

Show All | Top 5 | Top 10 | By Mayor Group | 1. PLANNING AND SCHEDULING

ID	Risk Cause	Risk Description	Probability	↑ Expected Cost	Impact	Area	Actions	Comments
6	Quantity of workforce > 7,000	Due to previous experience, and the large numbers of workers on site, especially during erection work, there will most likely be labour strikes to resolve	80	2 160 000	2 700 000	Common	0	0
4	Contracting strategy	A local supplier for the power distribution package has been selected on a lowest price basis. Quality problems were experienced on previous projects. Quality problems may cause delays to commissioning.	25	1 662 500	6 650 000	Power Distribution (BOP)	1	2
5	Many projects ongoing in the same region	There is a risk that the quantity and quality of workforce is not available for the full duration of the project. On site training will be required to improve construction / erection productivity.	45	900 000	2 000 000	Common	0	0
1	Client defined start up date	The time objectives of the project are extremely demanding. Minor delays will be difficult to recover and have the potential to delay the project.	25	160 000	640 000	Project Wide	0	0

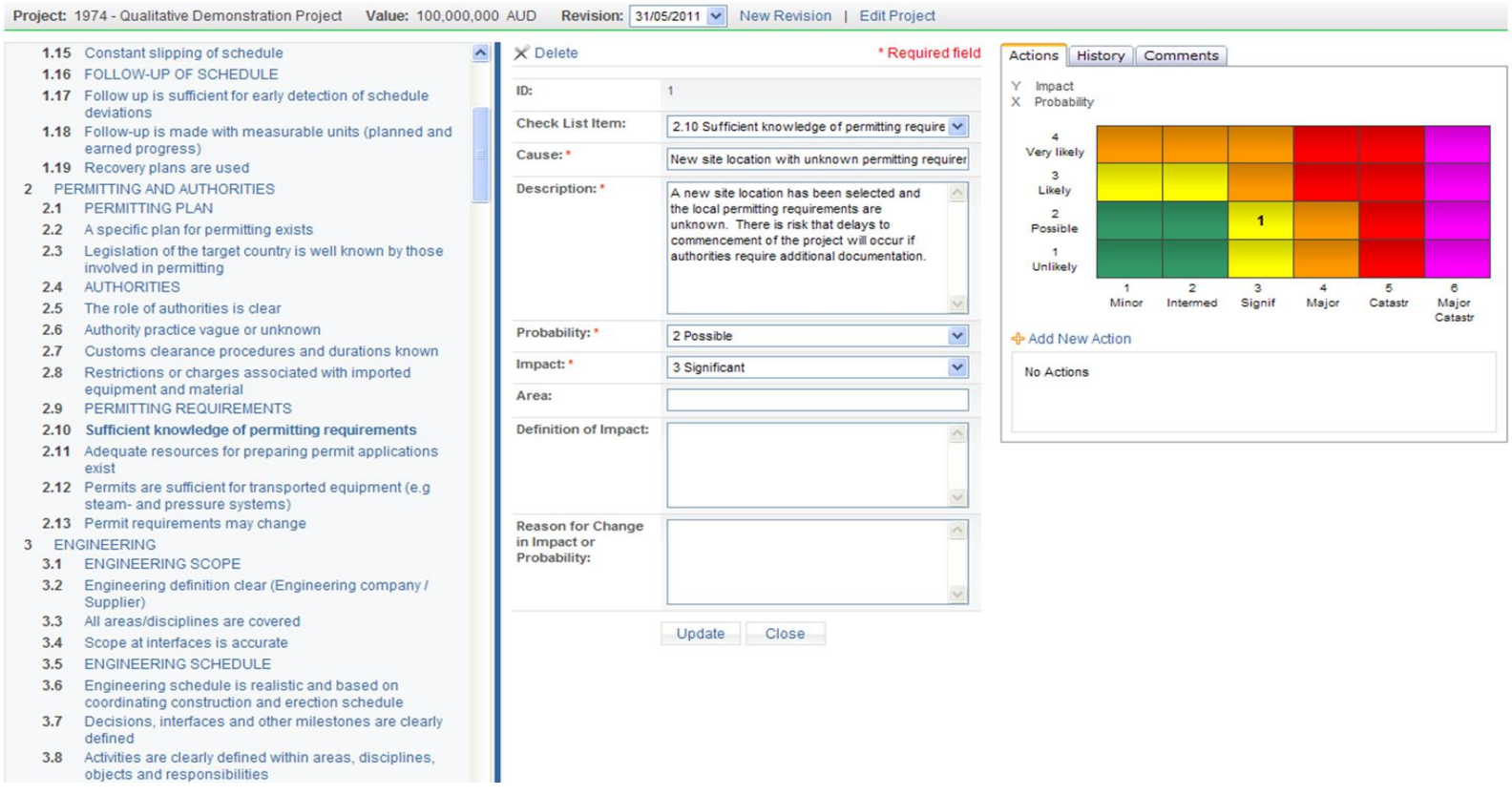
Risk Management- Co-Pilot™ - application

Risk evolution over time

Show All | Top 5 | Top 10 | By Mayor Group | 1. PLANNING AND SCHEDULING

ID	Risk Cause	Risk Description	Probability	↑ Expected Cost	Impact	Area	Actions	Comments
6	Quantity of workforce > 7,000	Due to previous experience, and the large numbers of workers on site, especially during erection work, there will most likely be labour strikes to resolve	70	1 890 000	2 700 000	Common	1	0
4	Contracting strategy	A local supplier for the power distribution package has been selected on a lowest price basis. Quality problems were experienced on previous projects. Quality problems may cause delays to commissioning.	25	1 050 000	4 200 000	Power Distribution (BOP)	1	2
5	Many projects ongoing in the same region	There is a risk that the quantity and quality of workforce is not available for the full duration of the project. On site training will be required to improve construction / erection productivity.	45	900 000	2 000 000	Common	0	0
8	New technology	Effluent treatment supplier is providing a new technology solution that has not been	15	675 000	4 500 000	Effluent	0	0

Co-Pilot™ - application - Qualitative Analysis



Case Example

ELDORADO PULP MILL – BRAZIL 2013

separate slides

Benefits of Risk Management

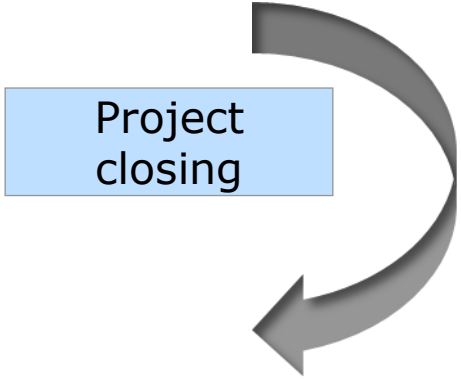
- systematic process
- increased transparency
- awareness
- cost savings
- reduced disputes
- working method improvement
- documented risk reporting

Increasing the probability of the project achieving its objectives.

Successful Investment Project (ref. Lecture 2)

Criteria

- **The plant is completed within schedule**
- **The plant is completed within budget**
- **Production starts / develops as planned regarding product quality and quantity**
- **Product sales begins according to the market preconditions**
- **Operation & maintenance runs reliably**



Conclusion (ref. Lecture 2)

Succesful project implementation
is all about
Management of Risk

Lesson Learned

- **Risk: sailing boat's speed becomes slower due to growth of "seafood" on the bottom part of the boat;**
- **Cause: missing anti-fouling paint**
- **Mitigation: use of anti-fouling paint**
  - Anti-fouling paint was used, BUT the type of the paint used was wrong (not suitable for big oceans)

- **Lesson Learned:**

PAY SPECIAL ATTENTION TO THE RISK MITIGATION ACTIONS and FOLLOW THAT THESE ARE EXCECUTED ON TIME

3. Contract Management

Contract Management

Work Processes	Tasks	Deliverables
Contract Management	Contract Administration	• Correspondence • Minutes of meetings • Formal acceptance of service
	Change Management	• Project Change Requests • Project Change Orders • Project Change Register
	Claim Management	• Claim for unfulfilled obligations • Claim response

Contract Management Objectives

- Ensure that the rights, obligations, responsibilities and liabilities of the parties are clearly defined
- Ensure that contracts are fulfilled at the right time and in a right way
- Increase client satisfaction
- Decrease the meaning of gap-filling laws and regulations and improves foreseeability
- Decrease the risk of financial loss
- Improve the contracting process
- Help manage and mitigate the liability risk

Contract Administration

- Proposal phase
  - Define scope clearly
  - Timing of events
  - Define change management process
  - General Terms and Conditions
  - Background checks
  - Tax issues
- Initiation phase
  - Communicate contract to team
  - Prepare contract management plan
- Execution phase
  - Maintain continuous, consistent, and complete documentation
  - Confirmation in writing
  - Proactive change management
- Closing phase
  - Document contractual completion, formal acceptance
  - Settle all claims, complete final payments

Change Management

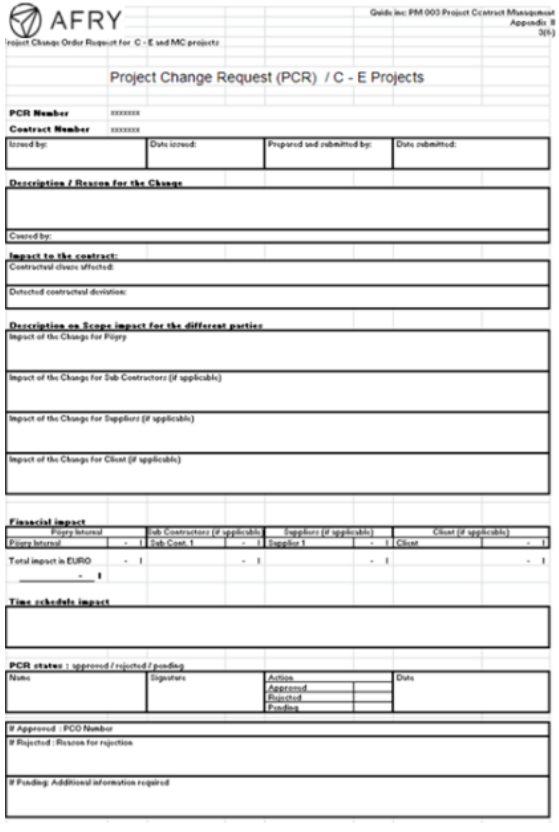
Continuously identify, assess, and implement changes to the contractual scope of work, cost, or schedule.

Raised by any contractual party – caused by any project participant.

- Project Change Requests
- Project Change Orders
- Project Change Log

Change Management Tasks

- Identify Change
  - Separate meetings / progress meetings
  - Daily work
- Prepare and submit Project Change Request
  - Standard template, analyse impact and define change
  - Agree internally to submit
  - Present to client
- Convert Project Change Request to Project Change Order
  - Forms part of contact documentation
  - Integrate into project execution, inform team
- Monitor status of all PCR's and PCO's using change log
  - Standard template
  - Highlights when to take further action
- Agree Change/Claim strategy
  - Negotiate further
  - Commence claim management
  - Accept that change is rejected



AFRY

Project Change Request (PCR) / C - E Projects

PCR Number

Contract Number

Issued by: | Date issued: | Prepared and submitted by: | Date submitted:

Description / Reason for the Change

Issued by:

Impact to the contract:

Contractual clause affected:

Detected contractual deviation:

Description on Scope impact for the different parties

Impact of the Change For Pöyry

Impact of the Change For Sub Contractors (if applicable)

Impact of the Change For Suppliers (if applicable)

Impact of the Change For Client (if applicable)

Financial impact

Pöyry Internal	Sub Contractors (if applicable)	Suppliers (if applicable)	Client (if applicable)
Pöyry Internal -	Sub Cont. 1 -	Supplier 1 -	Client -
Total impact in EURO -	-	-	-
-			

Time schedule impact

PCR status : approved / rejected / pending

Name	Signature	Action	Date
		Approved	
		Rejected	
		Pending	

If Approved : PCO Number

If Rejected : Reason for rejection

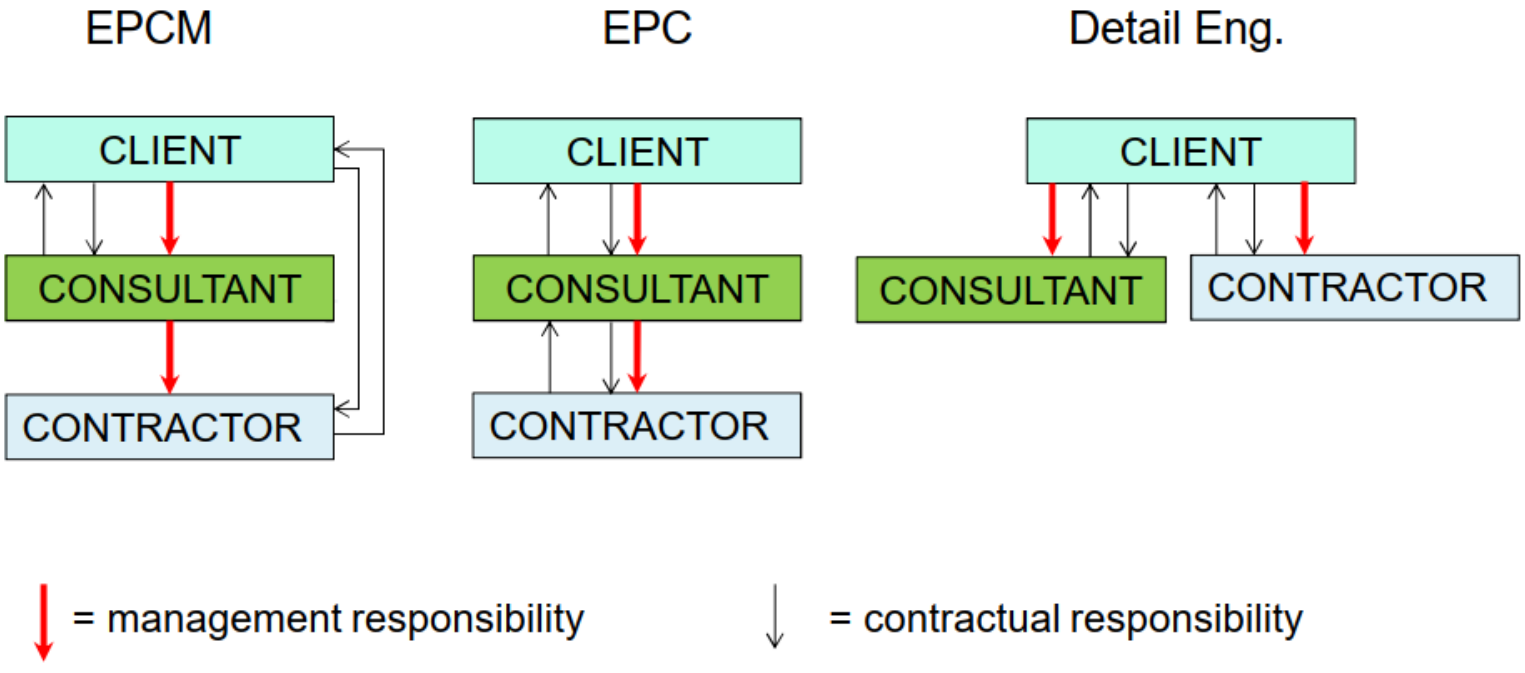
If Pending: Additional information required

Change Management

Maintain detailed records for change orders

- Time sheets (man hours) signed by client
- Material purchases
- Equipment & Small Tool usage
- Administrative cost
- Engineering re-design
- Schedule effect
- Manpower increase requirements

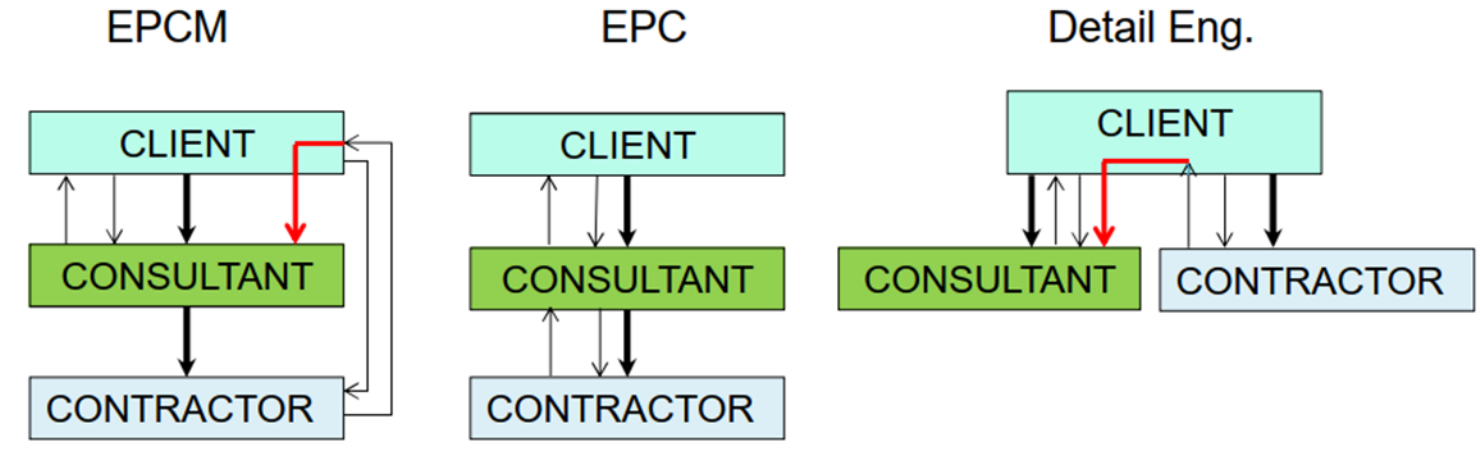
Typical service types



Claim Management

- Tendency to claim has increased – threshold to claim lowered
- Claims management becoming more professional
- Typical reasons for claims
  - tight, overrun budgets
  - poorly defined scope of work
  - disagreement on changes and additional work
  - unsuccessful project
  - ”take it from the insurance”
- Claim and dispute management is
  - expensive
  - takes management time from business
  - unpredictable for outcome → you seldom win!
  - a delay of payments
  - a risk in client relationship

Common consultant scenarios



= management responsibility = contractual responsibility = 3rd party claims

Claim Management

Sources of failure in project that can lead to claims

- Inadequate planning
- Acceptance of unrealistic time schedules
- Inadequate project follow-up
- Insufficient utilisation of existing resources
- Project staff participate in too many projects simultaneously
- Insufficient definition of project targets
- Poor communication
- Undue optimism in relation to cost and time requirements
- Unclear responsibilities
- No risk management
- Expansion of project scope during the execution

Claim Management

Typical alleged errors/negligence causing claims against consulting engineer

- Wrong measurements
- Calculation errors
- Structural errors (wrong concept)
- Piping errors
- Omission of a circumstance, fact or surrounding factor
- Negligence in relation to soil investigation studies and geotechnical design
- Misunderstanding on the deliverables or the schedule
- Negligence in supervision or construction management duties
- Pass-through of third party claims

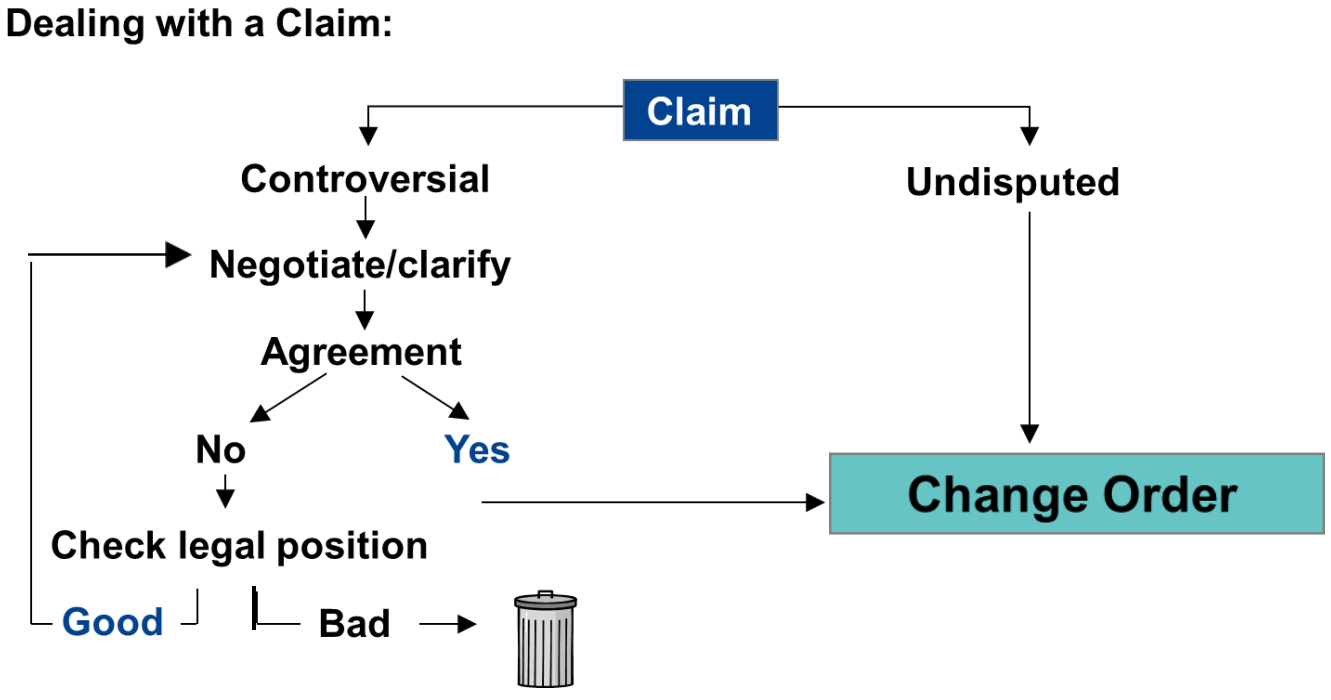
Claim Management

Settlement of disputes

- Different ways of settlement
  - Negotiation
  - Arbitration
    - Final, normally appeal not possible
    - Normally faster but more expensive than litigation
  - Litigation
    - Public
    - May be slow, subject to appeal to higher courts

- Always try to negotiate
  - Usually cheapest
  - Least time consuming
  - You know the outcome

Claim Management



Claim Management

- **When you face a problem, DO:**
  - Remain calm
  - Report immediately to your Client and in-house lawyer
  - Ensure that your broker/insurer is informed immediately
  - Focus on problem solving
  - Only communicate orally:
    "*we'll look into it and get back to you shortly*"
  - Document, photograph, photocopy and collect evidence
  - Document carefully all Purchaser delays – even delays in responding
  - Consult your lawyer for all correspondence
  - Negotiate and mediate – but prepare to litigate!

Claim Management

KEEP GOOD DOCUMENTATION

- Continuous, consistent and complete documentation

  → too much is not enough!
- Minutes of meetings, records of decisions, notes of phone and conference calls, email and fax correspondence etc.
- Official and unofficial approvals and statements throughout project
- Always confirm in writing what has been agreed orally!

Claim Management

- Claim Management is easier when:
  - accurate scope and services description are in the contract
  - clear contract terms and conditions are agreed
  - good relationships with the customer have been established
  - PM had a chance to review the contract terms before signing off
  - sound procedures are in the contract to address claims
  - a good project documentation is available
  - CM is started early in the project execution

- Claim Management is more difficult when:
  - all this (left side) is not achieved!
  - previous lessons are not learnt
  - certain pressure on contractual parties (e.g. lack of cash to pay) are not known
  - client is not satisfied with our services
  - lack of continuity in the project team including change of PM (not in all case)!

Questions from students

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Thank you!

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