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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

Leena Castrén

Agenda

Introduction

1. Project Functions

2. Risk Management

3. Contract Management:

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

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Introduction

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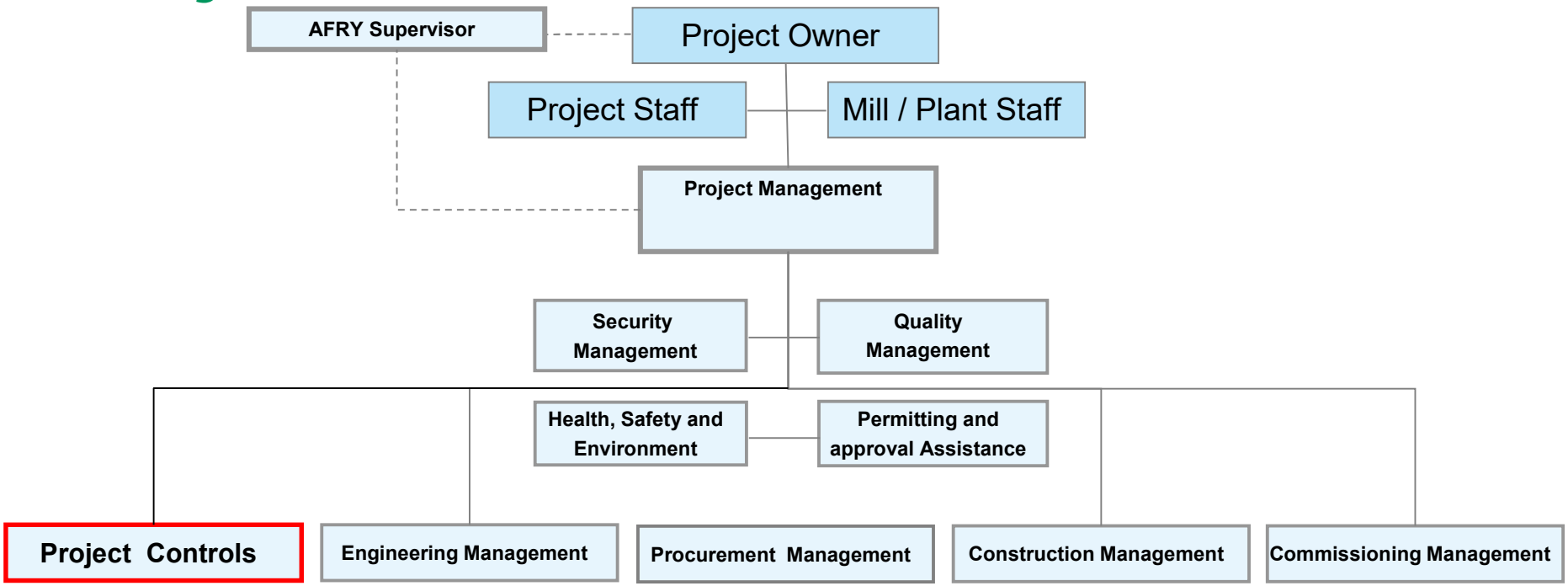
1. Project Functions

Project Functions



Project Risk Management

Contract Management
- Administration
- Change Management
- Claim Management

Resource Management

Time Management

Cost Management

2. Risk Management

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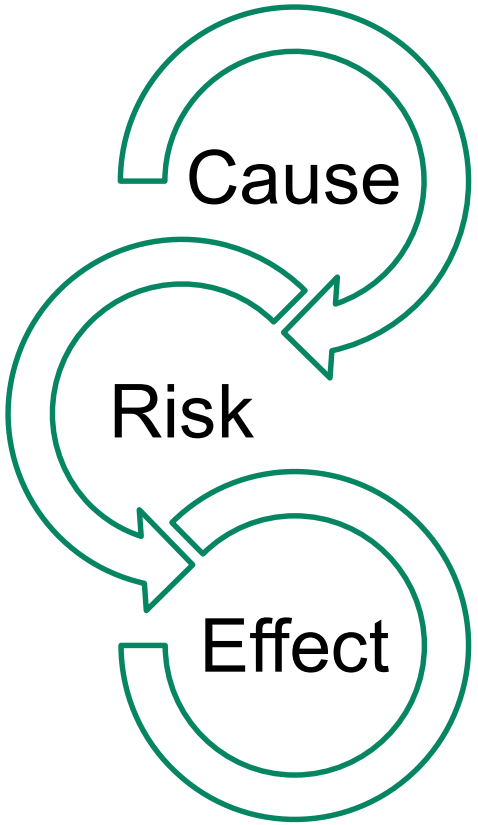
Risk Management

What “risk” means?

A situation involving exposure to danger.



Risk Analysis

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

$$R = (Probability\ of\ accident\ occurring) \times (Expected\ loss\ in\ case\ of\ accident)$$

$$R = \sum_{For\ all\ accidents} (Probability\ of\ accident\ occurring) \times (Expected\ loss\ in\ case\ of\ accident)$$

Organisational Risk Management

Operational risks

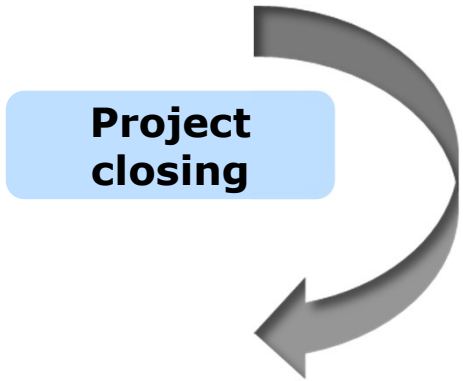
- Typically pronounced in risk evaluations due to demand for concrete actions
- Easier to recognize in the risk analysis

Project risks

- Technical
- Economical
- Reputational

Successful Investment Project (ref. Lecture 2)

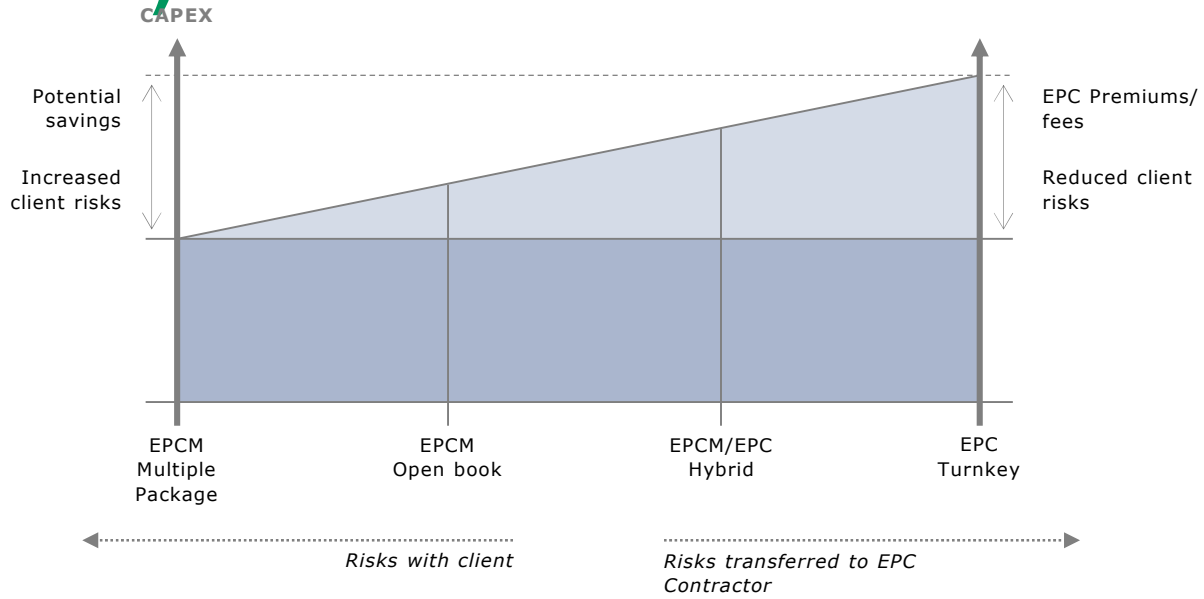
Development → **Implementation** → **Production**



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

Who carries the risk in projects (ref. also Lecture 2)



Full freedom for equipment & sub-contractor selection

Limited freedom for equipment & sub-contractor selection

Risk Management

Preparing for unexpected events during the project is increasing the probability of the project achieving its objectives

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

Qualitative and Quantitative methods

- Ranking – high, med, low (qualitative)
- % and €, statistical analysis (quantitative)

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 Registers Monitoring	Risk Review Report (continuation) *Risk register and action plan *Risk evolution charts

Risk Management Process

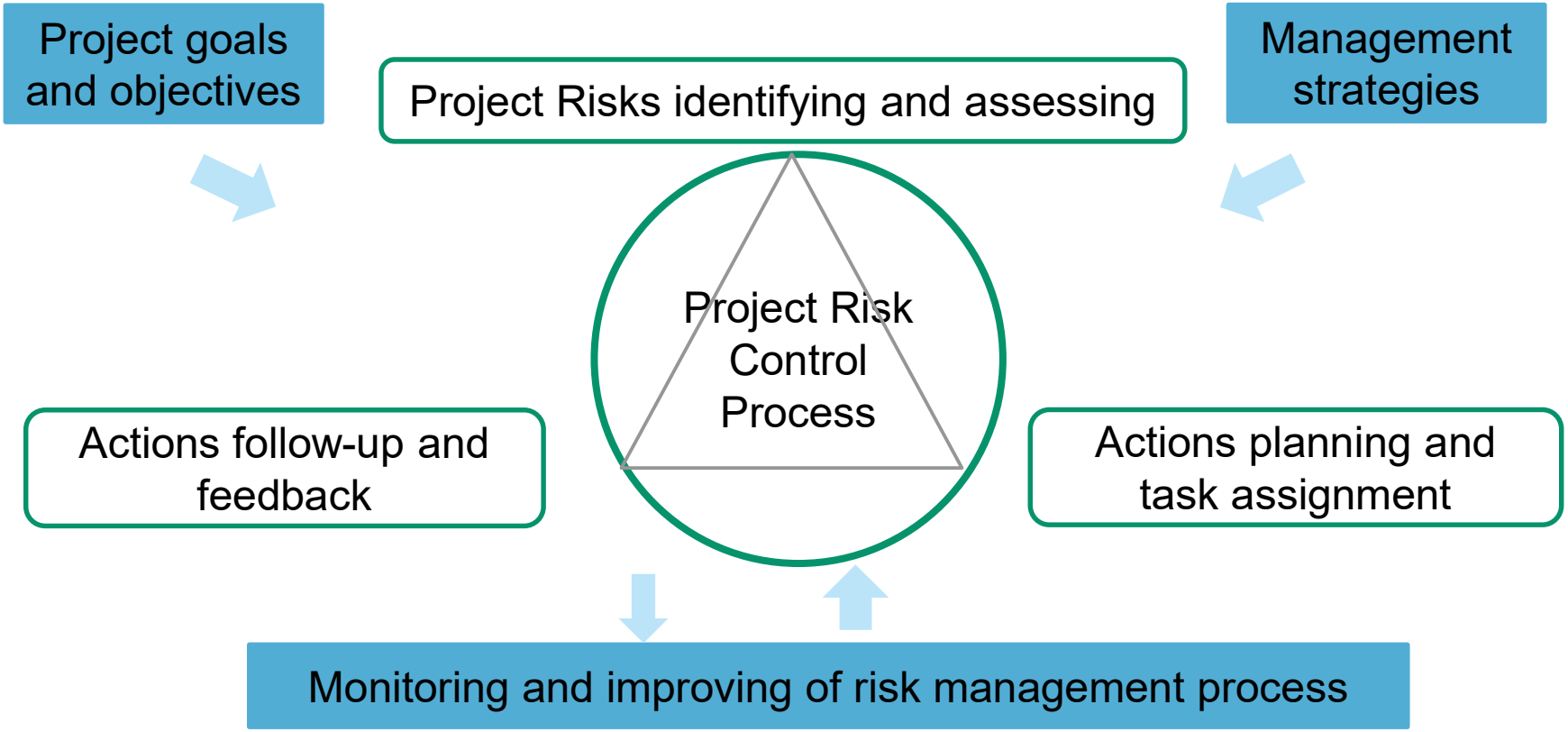
- **Definition** of risk management scope
- **Identification** of risks
  - Use of knowledge browser
- **Evaluating** the risks, defining probability (%) and impact (€)
- Defining **strategy** (tolerance level of risks)
- **Action planning** (defining, eliminating and mitigating actions, evaluating of actions on the risks)
- **Execution and control** (reporting, monitoring and feedback, trend analysis)

Pre project RM to assist in decision making

RM review meetings before important milestones, e.g. freezing points, in the project

RM closing meeting

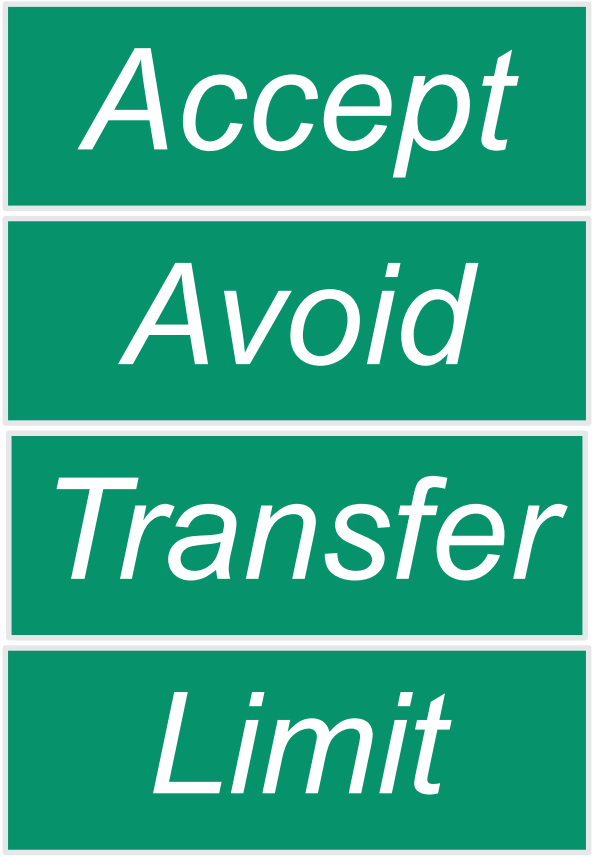
Risk register development and monitoring



Risk mitigation

Mitigation actions should always include both actions that

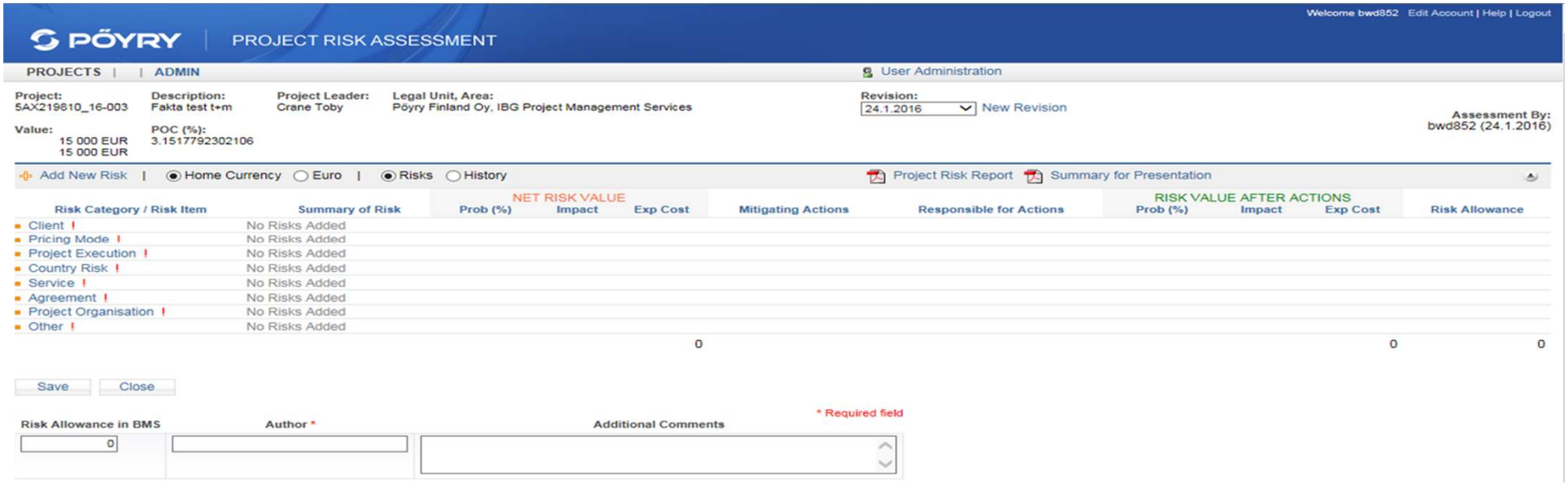
- aim to affect the causes
- preparation for the effects of the risk realization



Risk Management Applications

Approach varies depending on the use case

- Simpler approach used for sales cases
  - Utilisation of risk matrix
- More thorough approach for large complex investment projects



Risk Management Lessons Learned

Risk

Sailing boats speed becomes slower due to growth of “sea food” in the bottom of the boat

Cause

Missing anti-fouling paint

Mitigation

Use of anti-fouling paint

→ Anti-fouling paint was used, but it was wrong type for big oceans

Use special attention to risk mitigation actions and follow that they are timely executed

3. Contract Management

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Objectives for Contract Management

- Ensure that rights, obligations, responsibilities and liabilities are clearly defined
- Ensure that contracts are fulfilled at right time in a correct way
- Ensure client satisfaction
- Managing and mitigating liability risks
- Decrease the risk of financial loss

Contract Management

Work Processes	Tasks	Deliverables
Contract Management	Contract Administration	Correspondence Minutes of Meetings Formal Acceptance of Service Settlement of finances
	Change Management	Project Change Requests Project Change Orders Project Change Register
	Claim Management	Claims Claim Responses

Contract administration

Contracting phase

- Clear scope definition
- Setting and scheduling of milestones
- Change management process definition
- General Terms and Conditions
- Background checks
- Tax issues

Initiation phase

- Contract communicated to the team
  - *Main contract clauses reviewed with the team*
- Preparation of contract management plan
- Agreement on the key individuals

Execution phase

- Continuous, consistent and complete documentation
- Confirmation of decisions and/or orders in writing
- Proactive change management

Closing phase

- Documentation of contractual completion (formal acceptance)
- Settling of all claims, completion of final payments

Change Management

What is change?

- A change to the contract scope
- Raised by any project party – caused by any project party
- Difference between change work and add work (there may be a difference between change and additional work in contract)
  - Change work is a change to the existing scope (process changes, routing changes to piping etc.)
  - Additional work is an addition to the existing scope (e.g. addition of waste water treatment unit, when none was part of the original contract)

How to manage?

- Continuously identify, assess and implement changes to the contractual scope of work, cost and/or schedule
- Follow the Change Management Process defined in the contract
- Documentation of change and archiving the documentation
  - Project Change Request
  - Project Change Order
  - Project Change Register

Change Management Tasks

Identify change

- Separate meetings/Progress meetings
- Daily work of project personnel

Prepare the Project Change Request (PCR)

- Standard template, analyze impact and define change
- Internal agreement before submittal
- Present to client

Convert Project Change Request and Project Change Order

- Added to contract
- Integrate to project execution and inform project team

Monitor status of PCR's and PCO's using change register

- Standard template
- Highlights need for further actions
- Maintain detailed records of change
  - Man hours signed by client
  - Material purchases and equipment and small tool usages
  - Administrative cost
  - Engineering re-design
  - Impact on schedule and manpower requirements

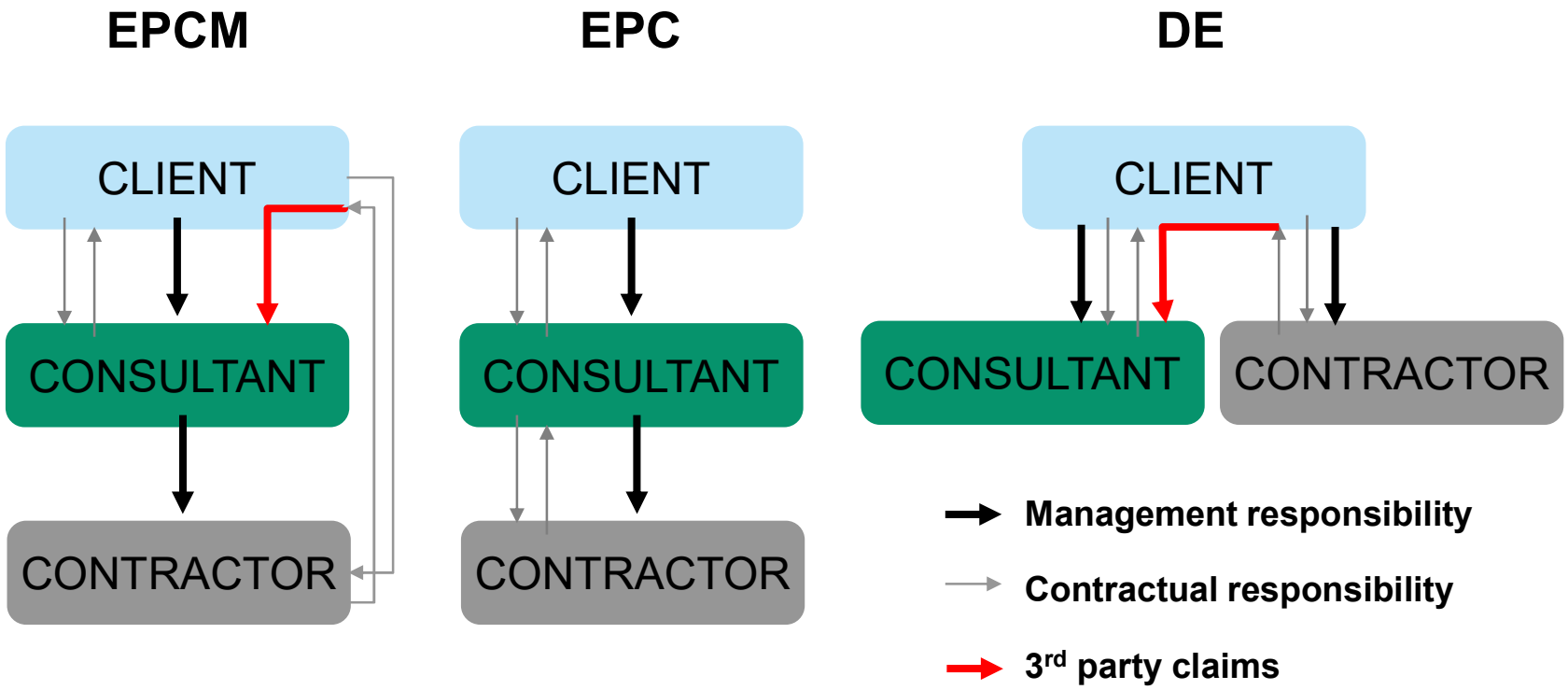
Agree on Change/Claim Management

- Negotiate
- Commence claim management
- Accept change rejection

Claim Management

- **Tendency to claim has increased – threshold to claim lowered**
- **Claims management becoming more and more professional**
- **Typical reasons for claims**
  - Tight overrun budgets
  - Poorly defined scope of work
  - Disagreement of changes and additional work
  - Unsuccessful project
  - "Take it from the insurance" – attitude
- **Claim and dispute management is:**
  - Expensive
  - Takes management time from business
  - Unpredictable outcomes → you seldom win
  - Delay of payments
  - Risking the client relationship

Common consultant scenarios



Sources for claims

- Inadequate planning
- Acceptance of unrealistic time schedules
- Inadequate time schedule follow-up
- Insufficient utilization of existing resources, failure to increase resources when needed
- Multiple simultaneous projects for project participants
- Insufficient definition of project targets
- Poor communications
- Undue optimism in relation to time and cost requirements
- Unclear responsibilities
- No risk management
- Expansion of project scope during execution

Reasons typical against consulting engineer

- Wrong measurements
- Calculation errors
- Structural errors (wrong concept)
- Piping errors
- Misunderstanding on the deliverables or schedule
- Negligence in supervision and construction management duties
- Pass through of third-party claims

Settlement of disputes

Negotiation

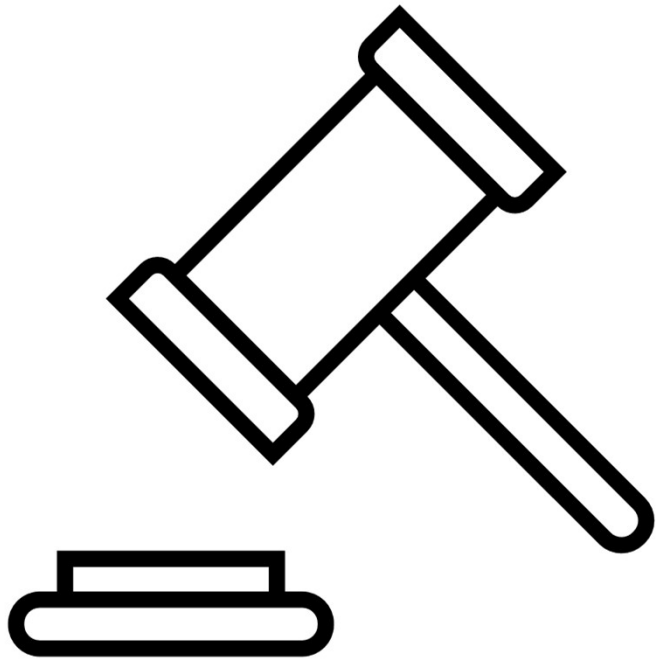
- Usually cheapest and fastest
- Outcome is known

Arbitration

- Confidential (EU area)
- Final, normally appeal is not possible
- Expensive
- Faster than litigation

Litigation

- Expensive
- Public
- Can be slow, subject to appeal in higher courts



Claim Management Tasks

When you face a problem DO

Project Management

- Remain calm
- Report to management and contact inhouse lawyer
  - Ensure that broker/insurer is informed timely
- Consult the inhouse lawyer for correspondence
- Report the issue to the client
- Document everything incl. all client delays, even delays in responding
- Focus on problem solving
- Always negotiate, but prepare to litigate

Consultant

- Remain calm
- Report immediately to your project manager
- Follow the instructions you get from the PM
- Document everything!
  - Photograph, photocopy, collect evidence
- Communicate carefully
  - It is always ok to say *: "We'll look into it and get back to you shortly"*

Claim Management Tasks

KEEP GOOD DOCUMENTATION

- Continuous, consistent and complete documentation

→ **Too much is never enough!**

- Minutes of meetings, records of decisions, notes of calls and other oral discussions, emails etc.
- Official and unofficial approvals and statements throughout the project
- Always confirm in writing what has been approved orally!

Claim Management wrap-up

Claim management is easier when:

- Accurate scope and services definition is in the contract
- Clear contract terms and conditions are agreed
- Good relationship with the customer has been established
- PM has a chance to review and affect the contract terms before sign off
- Sound procedures are in the contract address changes and potential claims
- A good project documentation is available
- Change management is continuous from the start

Claim management is more difficult when:

- The task in the left side list has not been fulfilled
- Previous lessons have not been learned
- Certain pressures on contractual parties are not known, e.g. lack of cash to pay
- Client is not satisfied with the services
- Lack of continuity in the project team

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Thank you!

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