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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*

*Leena Castrén*

# Agenda

## Introduction

### 1. Project Functions

### 2. Risk Management

### 3. Contract Management:

- Administration,
- Change Management and
- Claim Management



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# Introduction

# Leena Castrén

## **Quality Manager, Process Industries at AFRY**

**04/2022 –**

AFRY Finland Oy, Department Manager

05/2018 - 04/2022

AFRY Finland Oy, Lead Material Engineer

01/2018 - 04/2022

Neste Engineering Solutions, Senior Material Engineer

11/2015 - 12/2017

Neste Engineering Solutions, Material Engineer

03/2012 - 11/2015

Aalto University, Researcher, White Liquor Plants

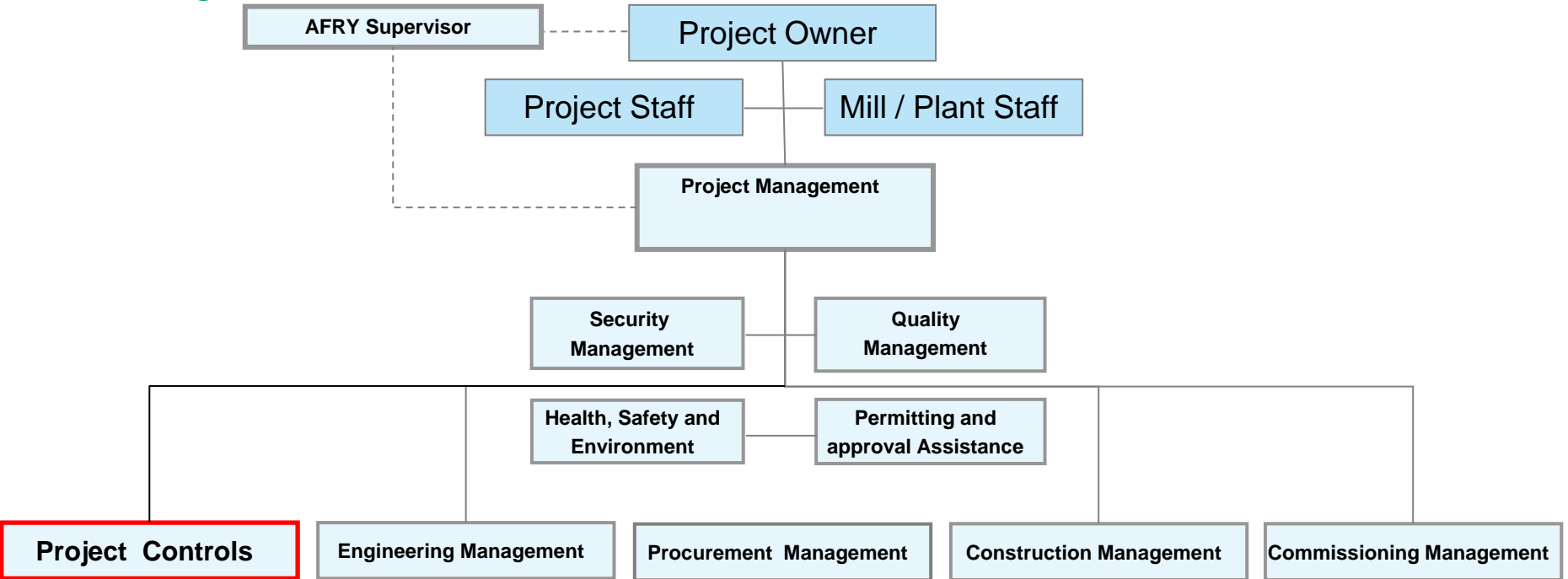
07/2011 - 03/2012

Outotec, Master's Thesis, "Patents in Technology Analysis"

01/2011 - 06/2011

# 1. Project Functions

# Project Functions



**Project Risk Management**

**Resource Management**

**Contract Management**

**Time Management**

- Administration
- Change Management
- Claim Management

**Cost 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

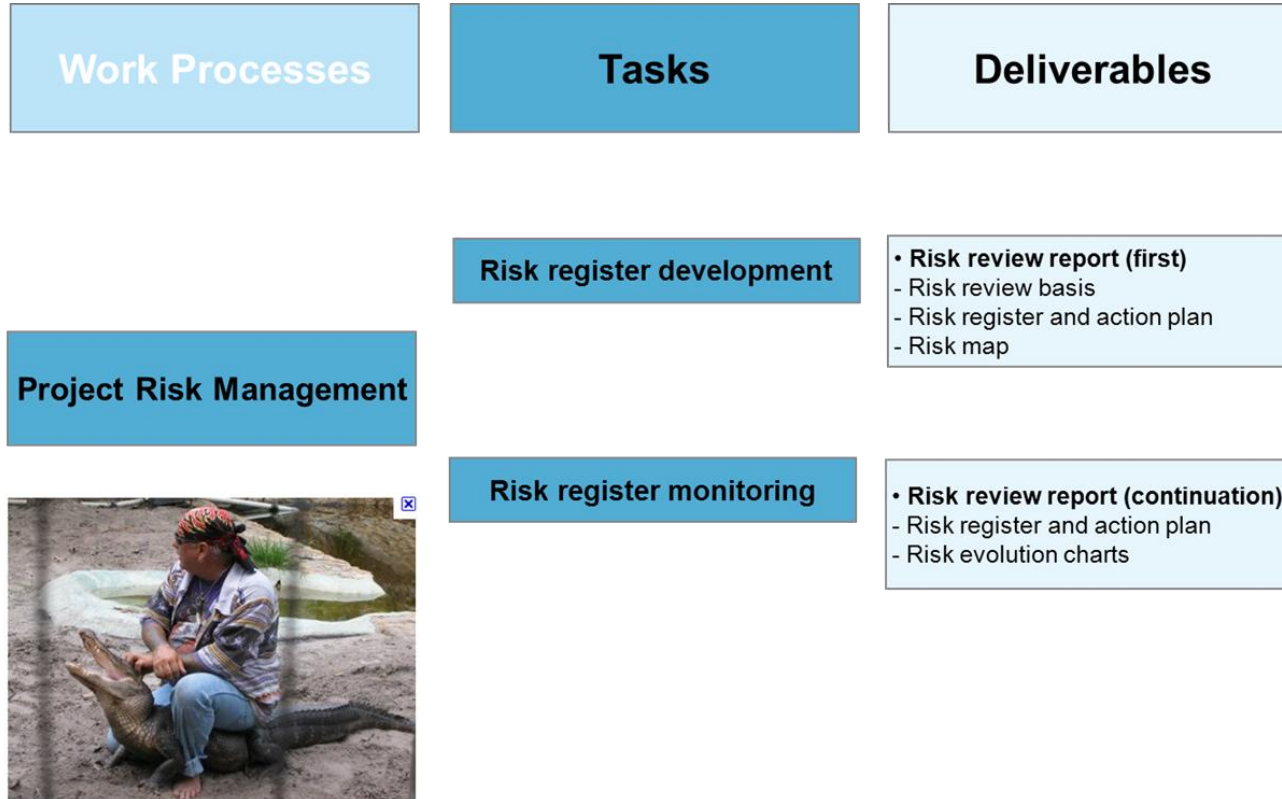
## Risk analysis

- 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.

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

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

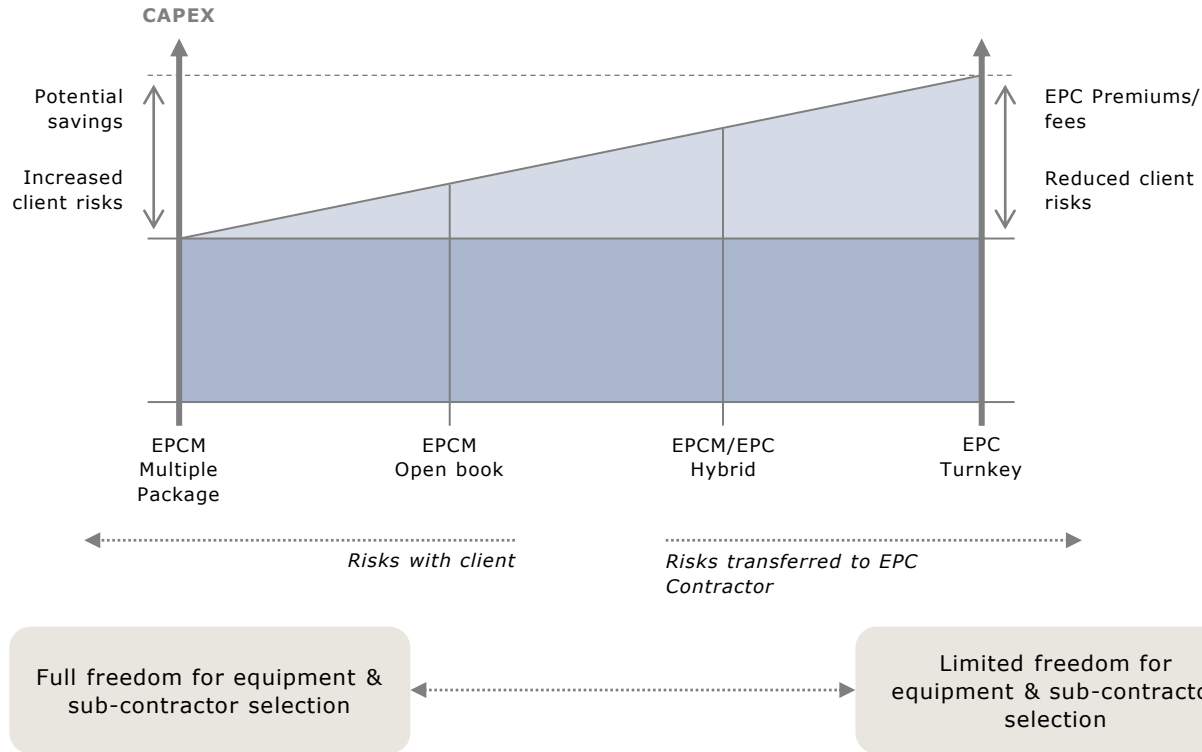
# Risk Management



# Risk Management

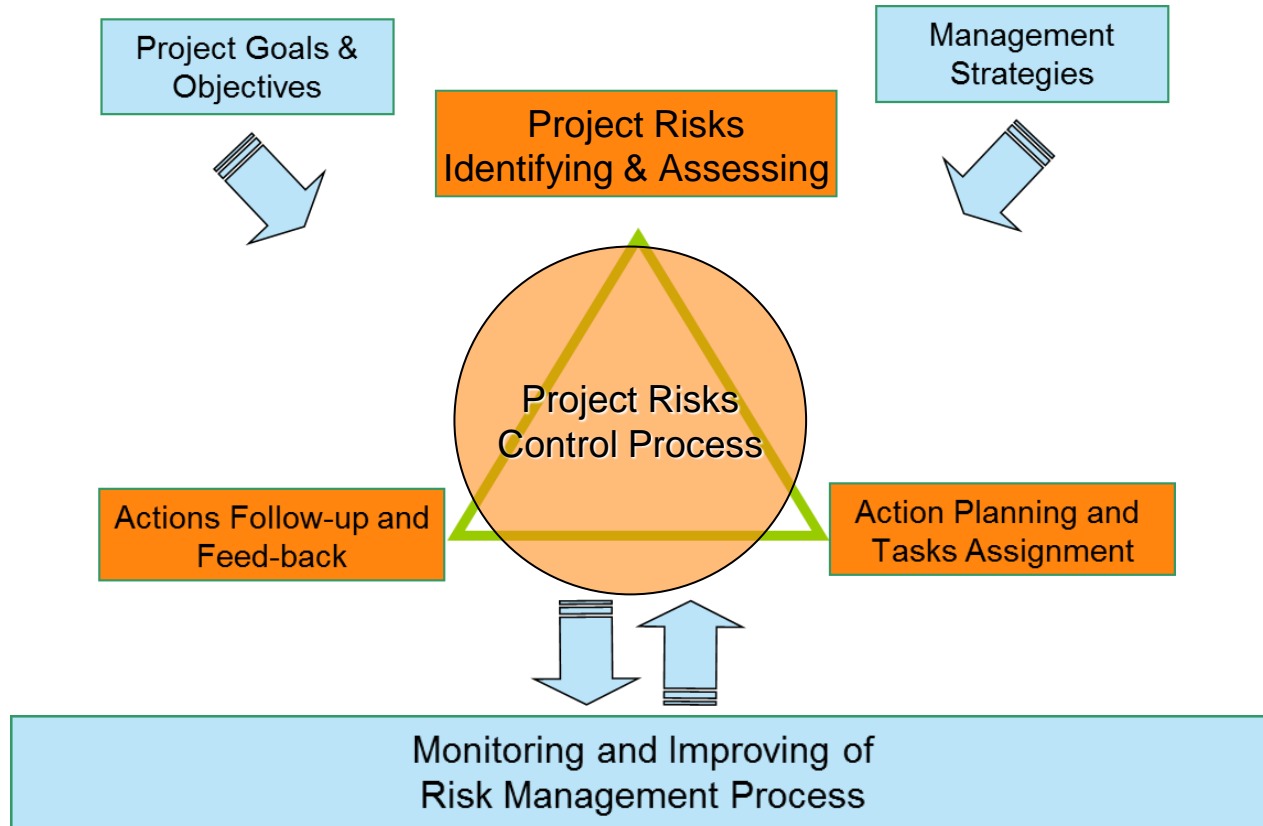
- Preparing for unexpected events during the project
  - Facilitates decision making in different project phases
  - Awareness of threats to project objectives
  - Inform management, transparency
  - Protects budget, schedule, and quality (safety and environment)
  - Understand challenges and their dimensions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





# Risk register development and monitoring



# Risk Management - Co-Pilot™ - application

**Separate slide set for the Co-Pilot and a case example  
Eldorado Pulp Mill in Brazil 2013**

# 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.

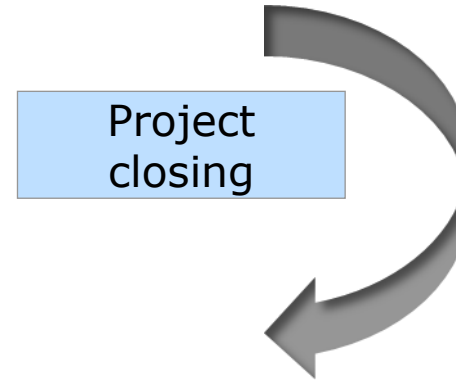


# Successful Investment Project (ref. Lecture 2)



## 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)

Successful 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 EXECUCUTED 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 contract 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 Guide No: PM 003 Project Contract Management  
Appendix B  
3/3

Project Change Order Request for C - E and MC projects

**Project Change Request (PCR) / C - E Projects**

PCR Number: xxxxxxxx  
Contract Number: xxxxxxxx

Created by:	Date created:	Prepared and submitted by:	Date submitted:
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**Description / Reason for the Change**

Created by:

**Impact to the contract**

Contractual items affected:

Detected contractual deviation:

**Description on Scope Impact for the different parties**

Impact of the Change for PIP (if applicable)

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				
PIPP Internal	Sub Contractors (if applicable)	Suppliers (if applicable)	Client (if applicable)	
PIPP Internal	Sub Contr. 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

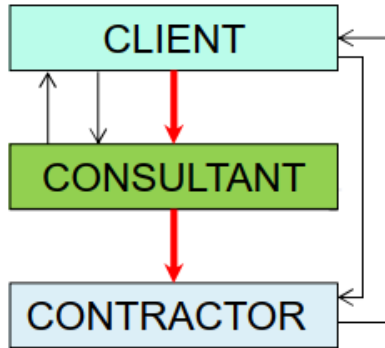
# Change Management

Maintain detailed records for change orders

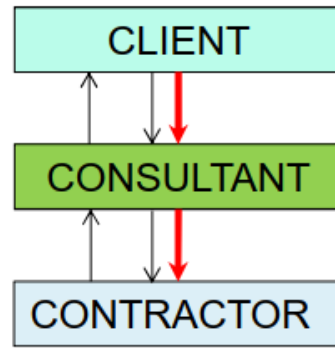
- Time sheets (man hours) signed by client
- Material purchases
- Equipment & Small Tool usage
- Administrative cost
- Engineering re-design
- Schedule effect
- Manpower increase requirements

# Typical service types

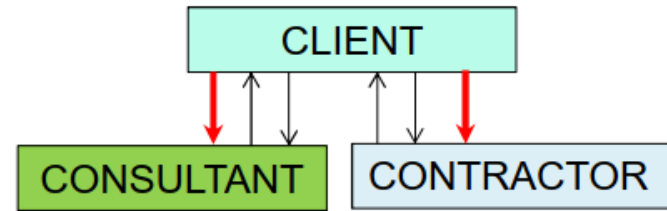
EPCM



EPC



Detail Eng.



↓ = management responsibility

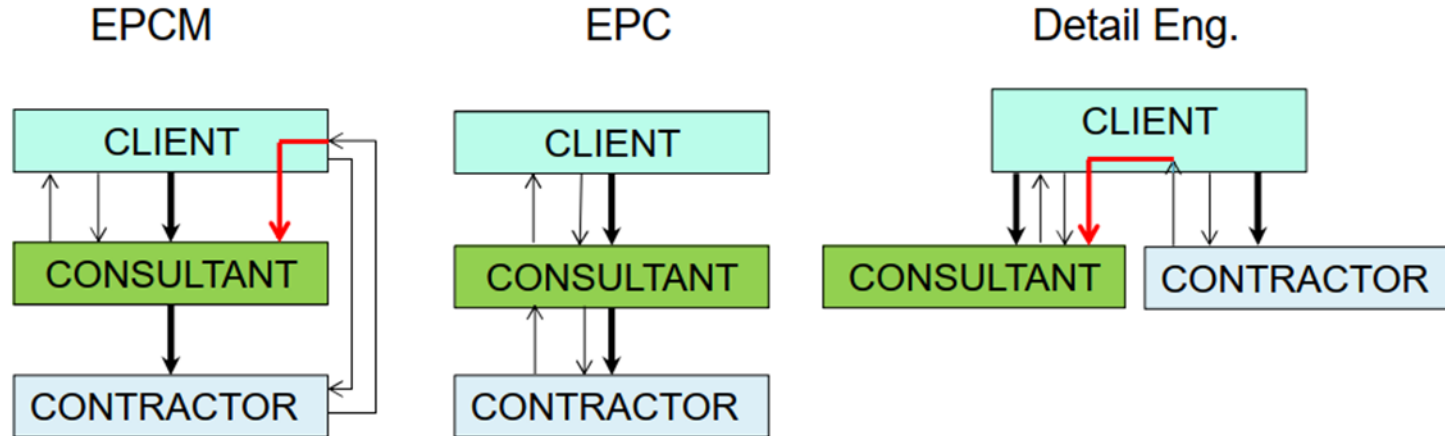
↓ = contractual responsibility

# 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    ↓ = 3<sup>rd</sup> 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

- **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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