INTRODUCTION

Course title: International Project Management

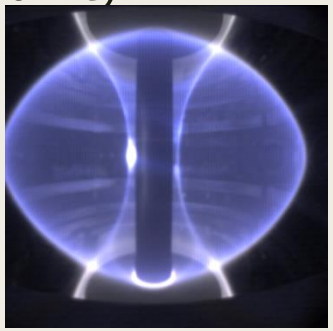
Lecturer: Nodirjon Makhkamov

Course Objectives

- To provide participants with:
  - *An awareness of the importance of applying good practice Project Management in projects of any size.*
  - *An understanding of essential elements, including the Leadership Role of the Project Manager, Project Planning, Risk Management and Stakeholder Engagement.*
  - *An understanding of the principle elements of design control to be applied within projects at Culham.*

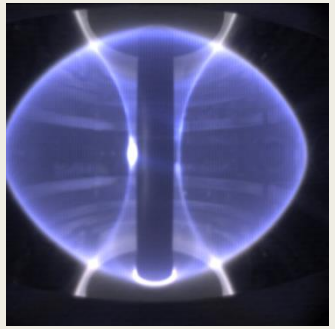
Culham Challenges

- "What are the particular technical challenges facing projects at Culham?"
  - *Research environment*
    - requirements may be hard to define and may change
    - producing one or a few items rather than production line
  - *Uncertainties of leading edge R&D* $\Rightarrow$
    - solutions may have to be developed, including possibly new technologies
    - 'first of a kind' so planning and estimating is difficult
  - *Need to balance the desire to get maximum performance versus achieving acceptable reliability/availability*



Culham Challenges

- "What are the particular management challenges facing projects at Culham?"
  - *Requirements hard to define and may evolve*
  - *Risk Management (all aspects) crucial but difficult*
  - *Cross functional team composition*
  - *Competing pressures on resources, e.g. design office*
  - *Working with scientific organisations not used to project and QA disciplines $\Rightarrow$ planning may be poor*
  - *Collaborative agreements rather than contracts*
  - *Political - EC funding requirements*
  - *Growing funding pressures due to ITER*



What is a Project?

"Unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost, quality and resources"

- A Project is a planned set of activities
- A Project has a scope
- A Project has time, cost, quality and resource constraints

What is Project Management?

- The art of organising, leading, reporting and completing a project through people

What is Project Management?

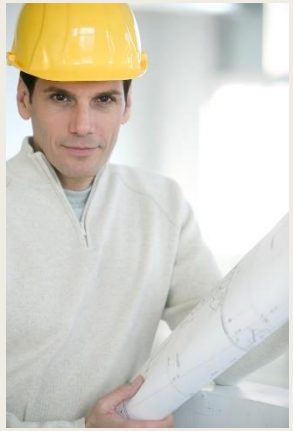
- A project is a planned undertaking
- A project manager is a person who causes things to happen
- Therefore, project management is causing a planned undertaking to happen.

Exercise 1

- Write down three attributes of a good Project Manager

Project Manager Role

- A Good Project Manager
  - *Takes ownership of the whole project*
  - *Is proactive not reactive*
  - *Adequately plans the project*
  - *Is Authoritative (**NOT** Authoritarian)*
  - *Is Decisive*
  - *Is a Good Communicator*
  - *Manages by data and facts not uniformed optimism*
  - *Leads by example*
  - *Has sound Judgement*
  - *Is a Motivator*
  - *Is Diplomatic*
  - *Can Delegate*



Stakeholder Engagement

Stakeholder

“A person or group of people who have a vested interest in the success of an organization and the environment in which the organization operates”

Exercise 2

- Write down three typical project stakeholders

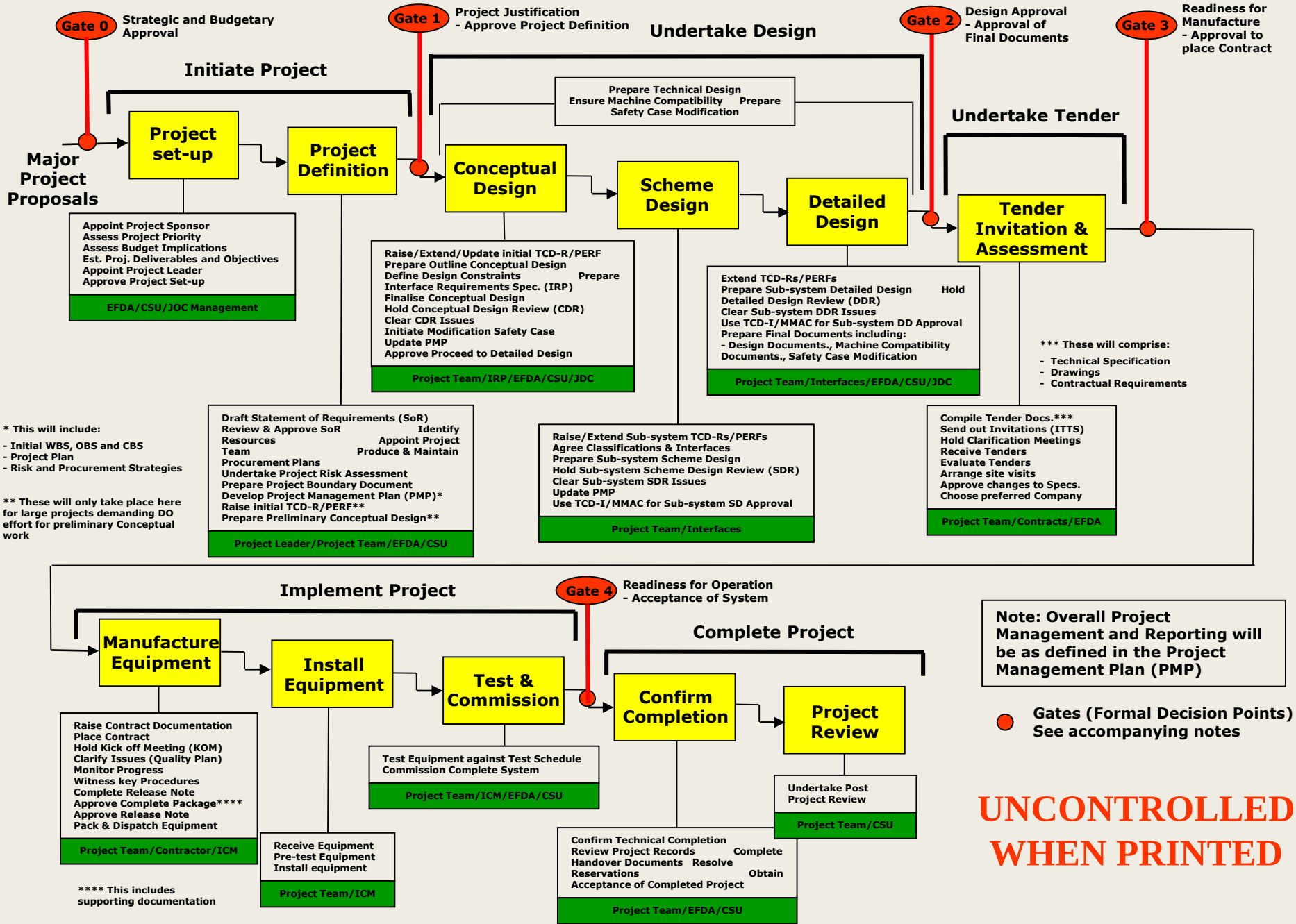
Exercise 2 - Typical Stakeholders

- Sponsor
- Funding Body
- Customer
- Suppliers
- End User
- HSE/Environmental Agency
- Maintenance Team
- Neighbours/Community/Shareholders
- Fusion Community
- Interfaces

Stakeholder Engagement process

- Identify Stakeholders
- Assess needs
- Define actions
- Establish communication channels
- Gather feedback
- Monitor and review

The Project Process



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Key Points in Project Set-up and Definition

- Create Project Management Plan (PMP)
- Be clear of scope and objectives
- Establish clear statement of what is to be done (WBS)
- Establish Risks to be Managed
- Establish Costs and Durations
- Establish Resources Required

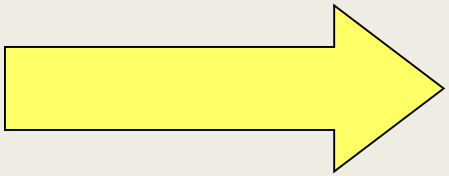
Project management Plan - PMP

- Master Document for Project
- Defines the following:-
  - ⇨ Project Objectives, Scope, Deliverables
  - ⇨ Stakeholders (Internal & External)
  - ⇨ Work to be done (WBS)
  - ⇨ Project Organisation and Resources (OBS)
  - ⇨ Project Costings (CBS)
  - ⇨ Project Schedule
  - ⇨ Procurement/Contract Strategy
  - ⇨ Risk Management
  - ⇨ Quality management
  - ⇨ Change Management

Project Planning

Project Planning

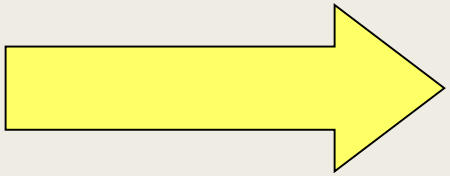
- Adequate planning leads to the correct completion of work



Planning

- Inadequate planning leads to frustration towards the end of the project & poor project performance

Project Start

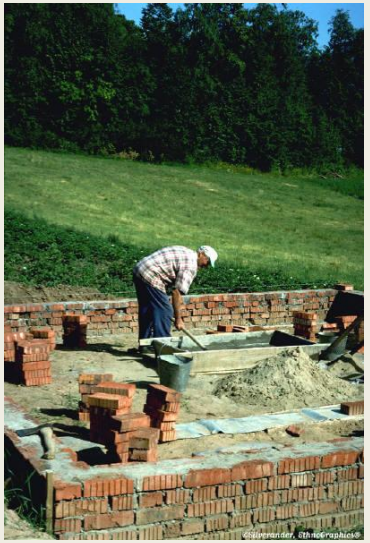


Project End

Work Breakdown Structure (WBS)

- The Work Breakdown Structure is the foundation for effective project planning, costing and management.
- It is the most important aspect in setting-up a Project

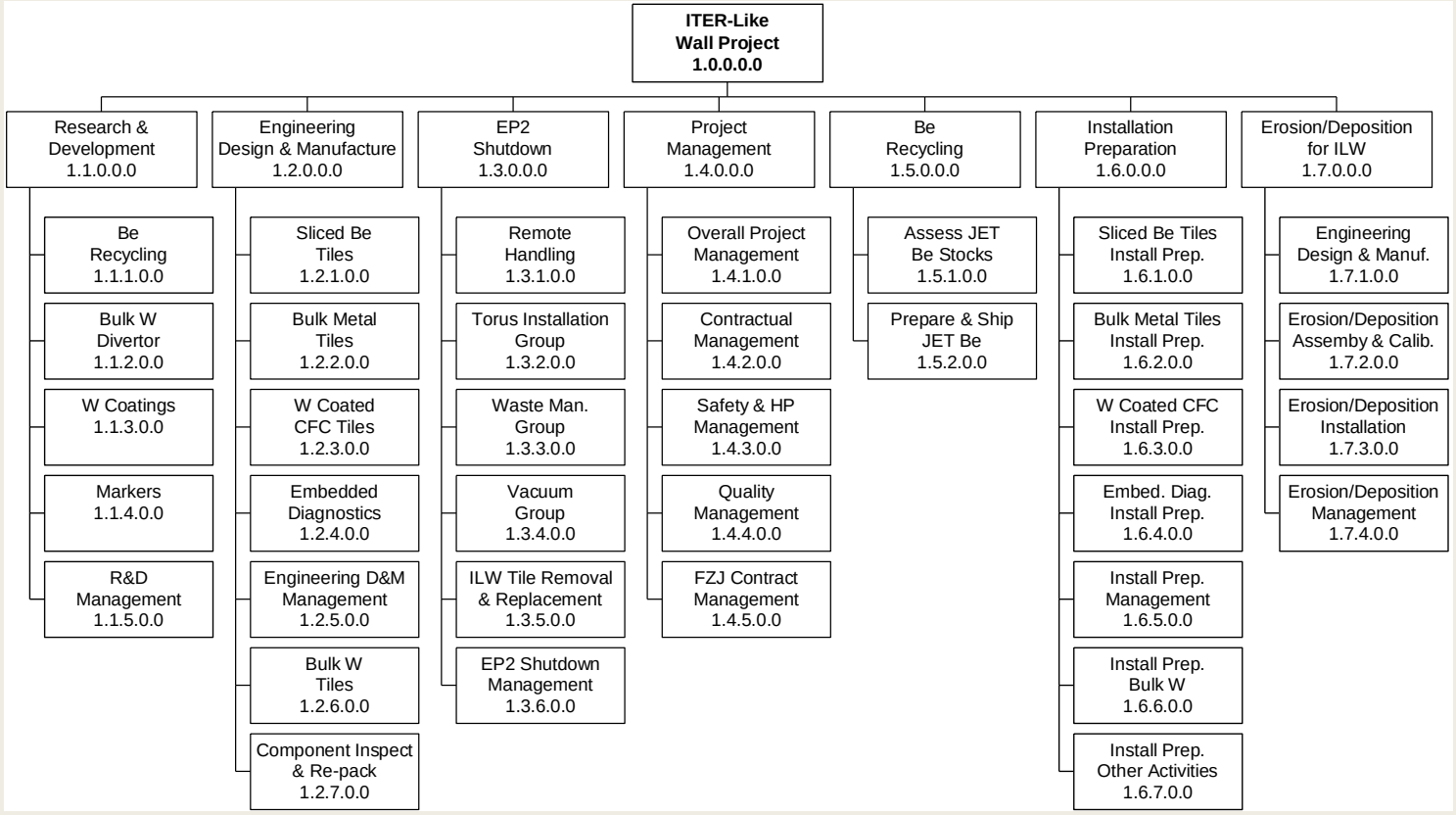
- It is the foundation on which everything else builds



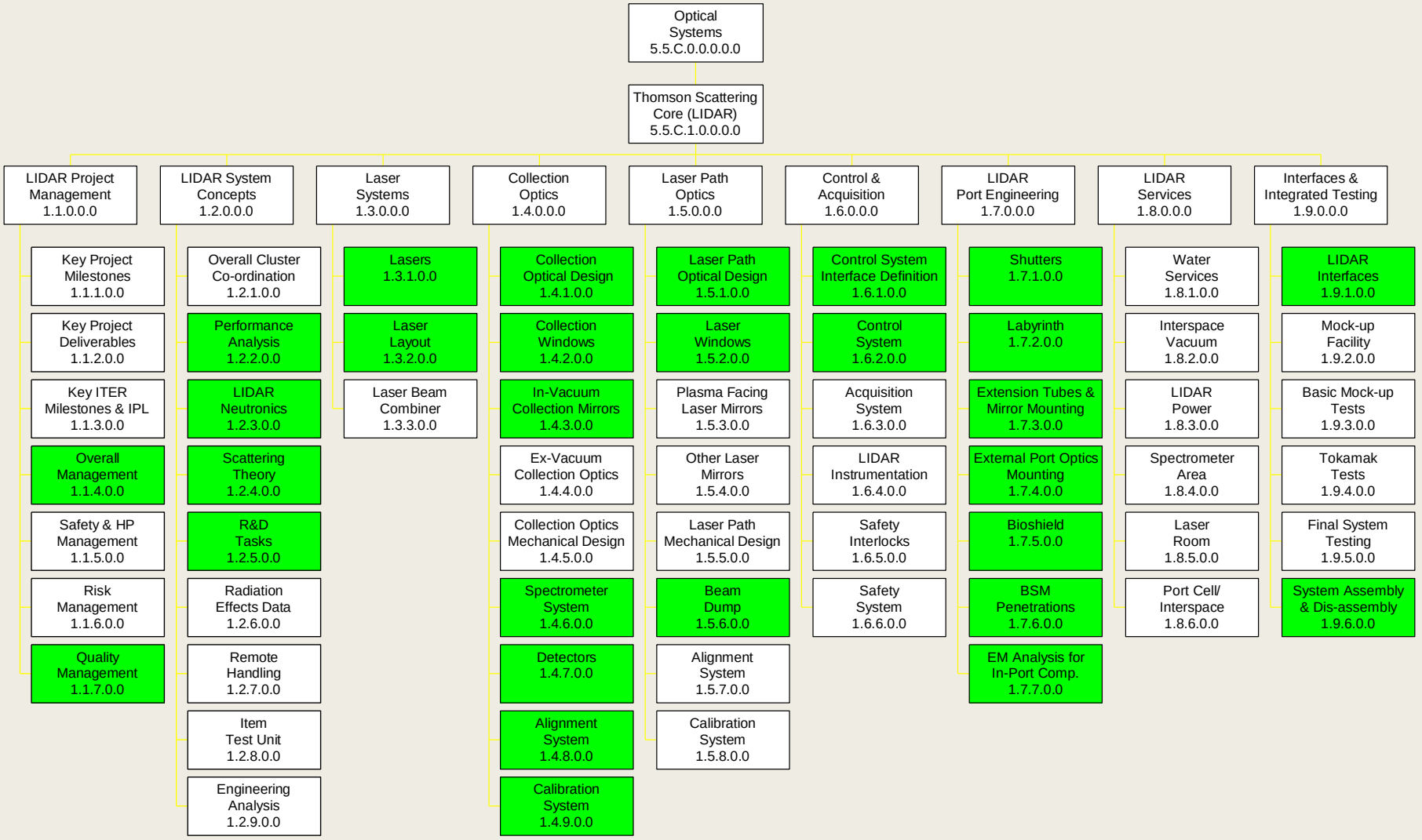
Work Breakdown Structure - Definition

"A Work Breakdown Structure (WBS) is a hierarchical (from general to specific) tree structure of deliverables and tasks that need to be performed to complete a project."

Example WBS - Top Level ILW Project



Example WBS - Top Level TSCL Project



Project Planning – WBS (1)

- Lowest Level of WBS is the Work Package (WP)
- WP can be clearly defined allowing package to be costed, scheduled and resourced
- WP contains a list of Tasks to be Performed that form the basis for the Schedule
- WP allows assignment of responsibilities (Work Package Manger, WPM)

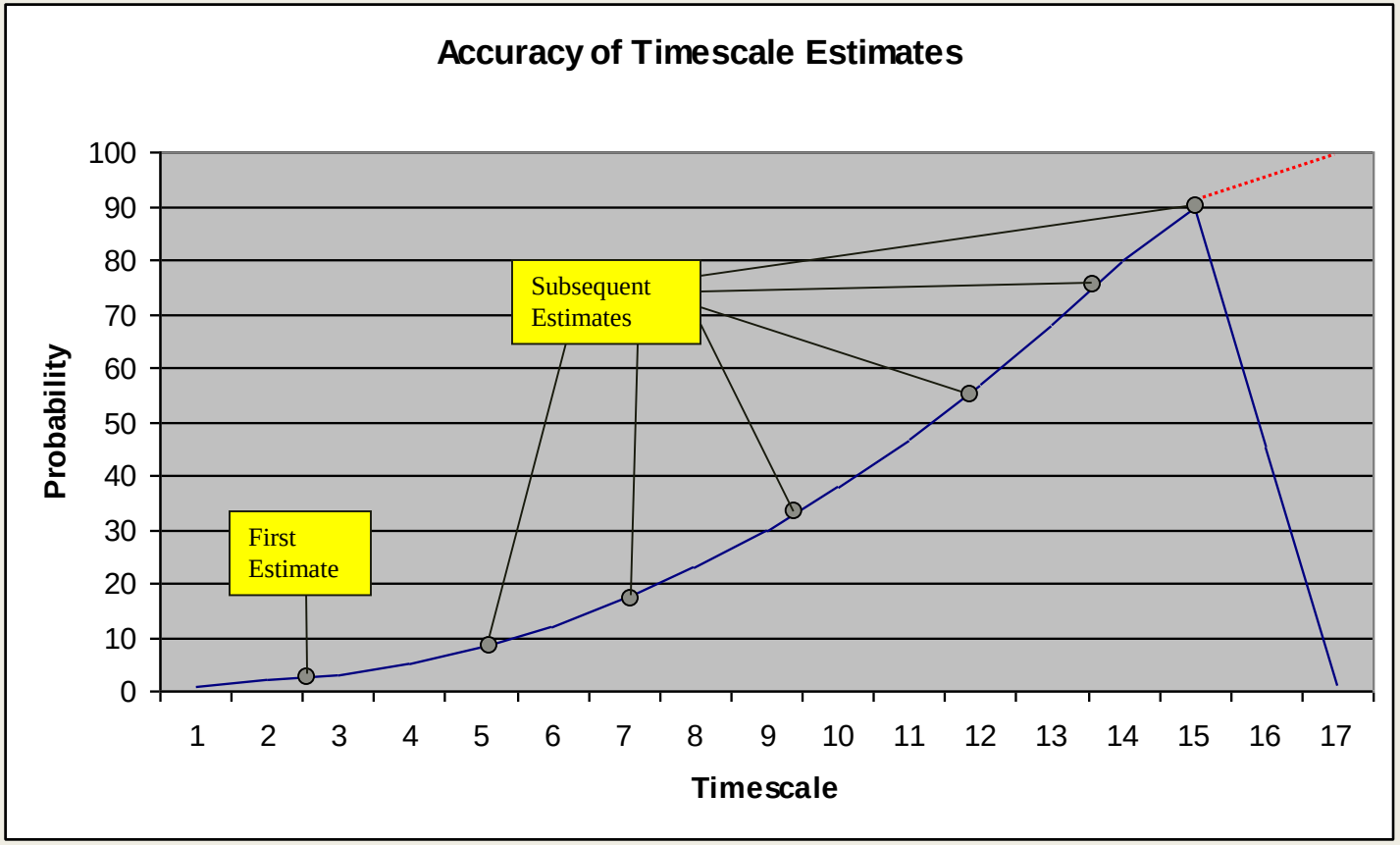
Project Planning – WBS (2)

- WBS allows hierarchical build-up of costs and schedule
- Cost and Schedule can be reported at any level of the WBS
- WBS facilitates strong management during project execution (Cost and Schedule control)
- WBS can be used for many other things - Document Management, Risk Management etc.

Project Planning

- A word about Scheduling
  - Schedules (task durations) can have a wide variation
  - There is no unique answer. Rather, there is a statistical variation depending on assumptions
  - Need to understand the basis of scheduling (Most challenging; Most likely; Absolute certainty - bet your life on it!)
  - Most people are very optimistic/naive

Common schedule development



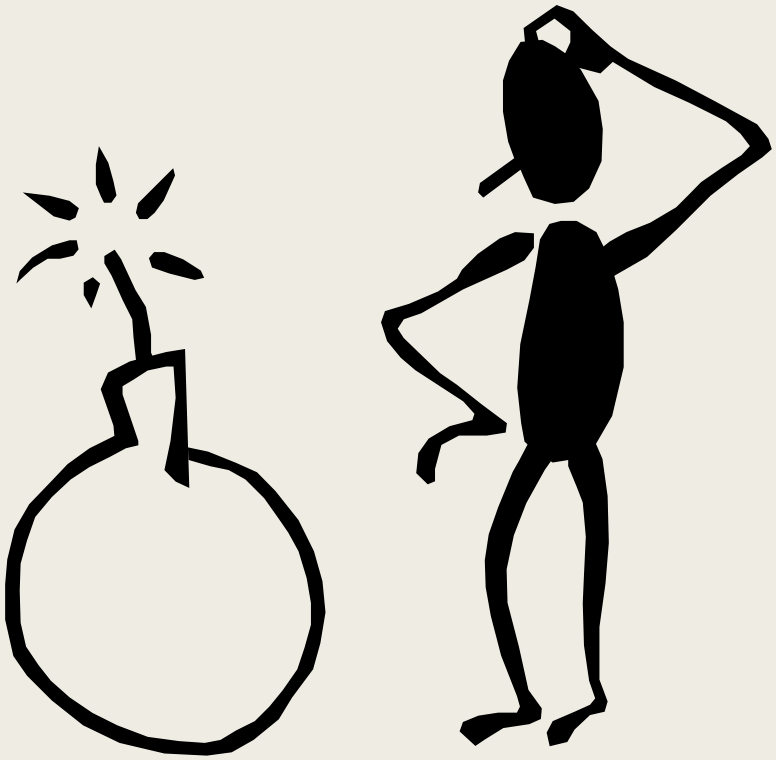
Example WBS for the ITER-Like Wall & TSCL Projects

MJ Kear

Project Planning – Key Points

- Recognise that adequate project planning is essential
- Produce a sound WBS
- Use the framework provided by the Project Management Plan (PMP) template
- Involve the right people
- Allow enough time
- Be systematic

Project Risk Management



Project Risk – Definition (1)

"Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective"

Project Risk – Definition (2)

"A combination of the probability of a defined threat or opportunity (Likelihood) and the magnitude of the consequences of the occurrence (Impact) defines a Risk Index"

Risk Impact

Threat → Scope → Poor Quality Product

Threat → Schedule → Late Delivery

Threat → Cost → Overspend

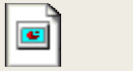
- In addition there are health, safety and environmental threats that **must** be managed (CDM Regulations)

Risk Management Process

- Identify Risks
- Assess likelihood and impact
- Rank risks and prioritise
- Define risk management approach & actions
- Implement actions
- Monitor & review

Example Risk Management for the ITER-Like Wall Project

MJ Kear



Risk Management – Key Points

- Make the management of risk integral to the way the project is managed
- Ensure that cost and time contingencies are consistent with identified risks
- Focus on the “significant few” – don’t try to manage too many risks
- Be vigilant and proactive

Project Monitoring and Control

Exercise 3

- Write down three typical project control/monitoring activities

Project Monitoring

- Typical Monitoring Activities
  - *regular reviews of progress against schedule using WBS as basis (Plan against Baseline)*
  - *regular review of actual costs (O/P from SAP) against budgeted costs and Earned Value at WBS level*
  - *regular review of resource loading*
  - *regular progress meetings with project team*
  - *regular meetings with contractors*
  - *production of periodic progress reports*
  - *risk reviews*
  - *inspections/ audits*

Project Control

- Typical Control Activities
  - *assign responsibilities at Work Package level*
  - *staged authorisation of work to be done*
  - *staged release of budgets (staged release of WBS(e) numbers)*
  - *ensure PM has a 'Management Reserve' under his control*
  - *seek corrective action reports when WPs go 'off track' (overrunning or overspending)*
  - *release Management Reserve carefully*

Project Monitoring and Control Summary

- Monitor against the plan – status regularly
- Take a factual approach to decisions
- Identify management action early
- Check that defined controls are being applied – correct if necessary
- Apply change control

INTRODUCTION TO DESIGN MANAGEMENT

Design Management

- Design takes place as part of a project
- Design Management is part of Project Management
- Design Management considerations must be included in the PMP

Exercise 4

- Write down three Design Management Activities

Exercise 4 - Design Management Activities

- Sub-divide Design Stages (CD, SD & DD)
- Sub-divide Tasks (WBS)
- Define Constraints and Interfaces (WPD Summary Sheet)
- Formally Initiate the Design (TCD-R/PERF)
- Ensure Design conforms to H&SE and CDM Requirements
- Hold Design Reviews (Peer review)
- Formally Approve Design (TCD-I/MMAC)

Design Stages

- Conceptual Design
- Scheme Design
- Detailed Design

Conceptual Design Phase

- TCD-R
- Decide Local or TCS route
- Develop Conceptual Design
- Define Constraints & Interfaces
- Carry out Conceptual Design Review
- Initiate Safety Case Modification if required
- Obtain Approval to Proceed to next stage

Scheme and Detailed Design

- Basic considerations and process similar to concept
- Need to ensure that safety & environmental issues receive proper consideration as design develops (CDM Regulations)

Exercise 5

- List who should be invited to a design review
- Write down three issues that should be considered at a design review

Exercise 5 - Design Reviews, Attendance

- Project Leader or nominee (Chairman)
- RO (Work Package Manager)
- Customer
- End User
- Safety and Quality Reps
- All other Relevant Interfaces/Stakeholders
- Other Experts in the area being reviewed

Exercise 5 - Design Reviews, Issues to Consider

- Assumptions and Constraints
- Technical Solutions - Does it meet the Spec?
- Safety, Environment and CDM issues
- Can it be Manufactured/Maintained?
- Actions from previous DRs
- Issues to be resolved (including Timescales)

Safety & Environment

- Need to ensure that safety & environmental issues receive proper consideration as design develops
  - *Involve the right people from the start*
  - *Systematically identify issues – Hazards/Risks, Environmental Aspects & Impacts*
  - *Carry out rigorous reviews at each design stage*
  - *Control Design Changes*
- MUST take note of CDM Regulations

CDM Regulations

- CDM - Construction (Design & Management)
- Regulations recently updated
- Now must have someone in EACH Project Responsible for CDM
- Currently information is on the Conceptual, Scheme & Detailed Design steps on the Process Maps
- More information will be developed over the coming months

Design Change control

- Needs to be a formal and defined procedure
- New procedure in place CD/P/J008 for JET Facilities

Confirm Completion

- Ensure design records are complete and accurate
- Ensure any outstanding actions or issues are addressed
- Ensure Maintenance Records are produced
- Ensure User Manuals are produced
- Hold a formal Post Project review

Reference and source

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