

Management of Reactor Decommissioning

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Introduction/ Background

- ◆ Managed the decommissioning of two research reactors in the UK
 - ◆ Scottish Universities Research Reactor 300kW Argonaut Design
 - ◆ ICI Triga reactor 250kW
- ◆ Managed a decommissioning project at Hunterston Magnox power reactor
- ◆ Managed various decommissioning projects on the Sellafield site in UK
 - ◆ Calder Hall cooling towers
 - ◆ Windscale pile 2 chimney
 - ◆ Windscale AGR research reactor

Agenda

- ◆ Definition of a Project/ Project Management
- ◆ Project Organisation
 - ◆ Suitably Qualified and Experienced personnel (SQEP)
 - ◆ Training Requirements
- ◆ Quality Assurance
 - ◆ Project Manual
 - ◆ Quality Plans
 - ◆ Installation
 - ◆ Waste Management
 - ◆ Operations
 - ◆ Procedures
 - ◆ Method Statements (Installation Activities)
 - ◆ Operating procedures
 - ◆ Maintenance procedures
 - ◆ Routine surveys
- ◆ Project Schedule
- ◆ Questions

Definition of a project

A unique set of co-ordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost and performance parameters

Project Management

The planning, monitoring and control of all aspects of a project and the motivation of all those involved in it to achieve the project objectives on time and to specified cost, quality and performance

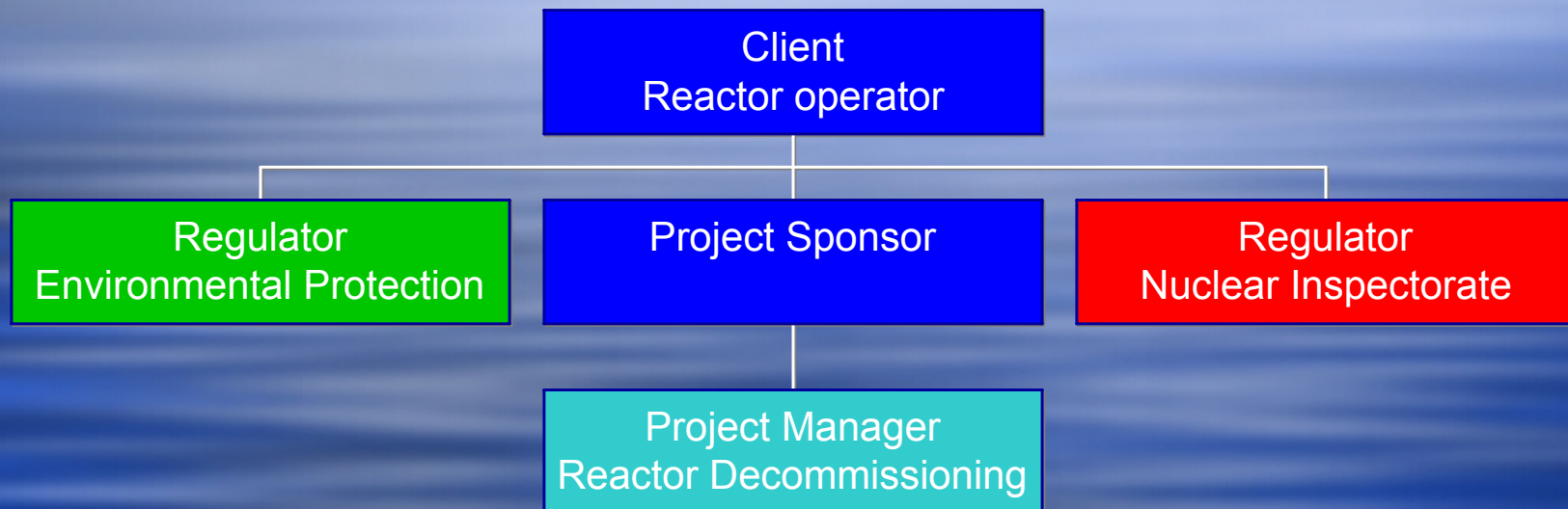
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The Project Manager

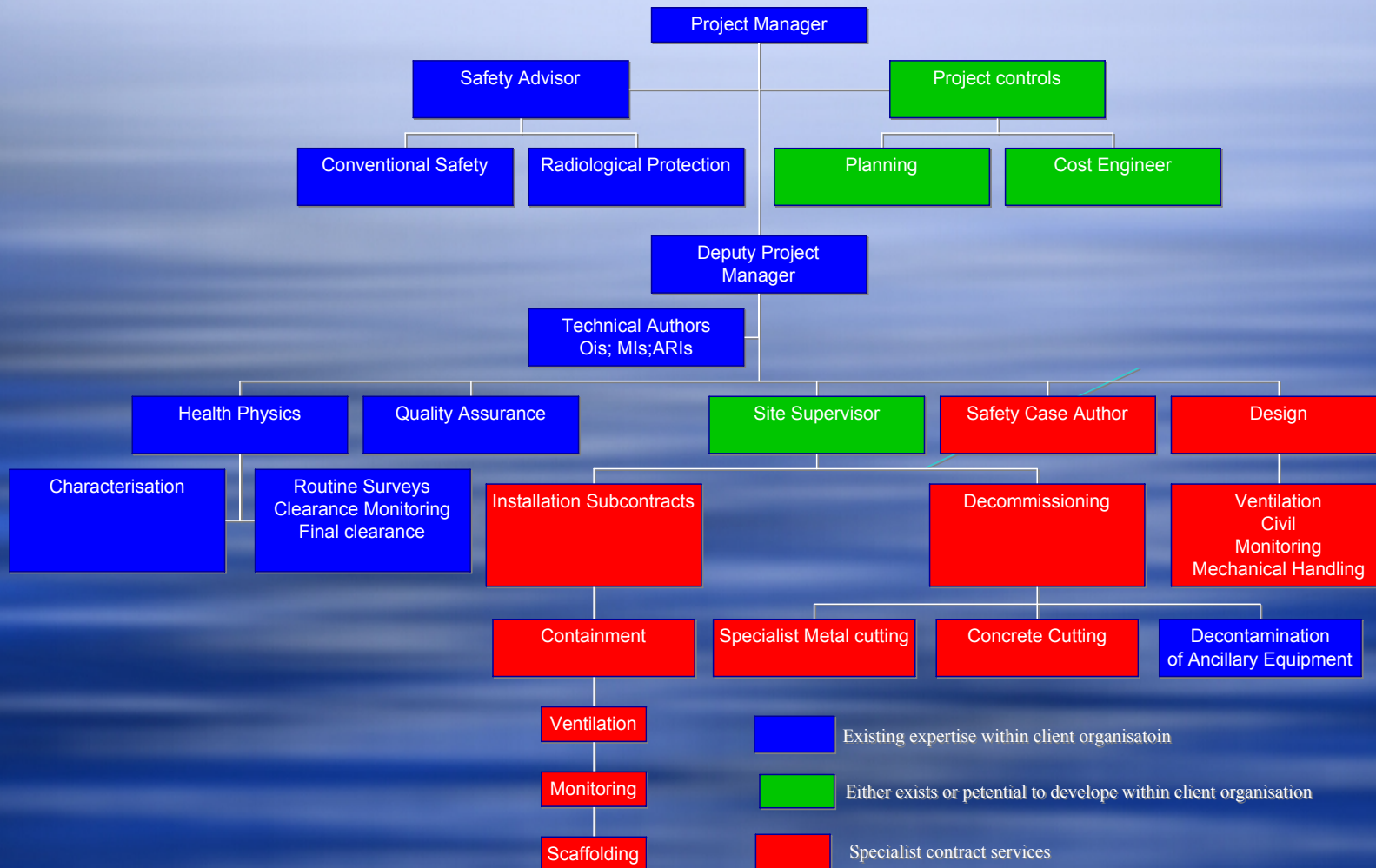
Project management is quite often the province and responsibility of an individual project manager. This individual seldom participates directly in the activities that produce the end result, but rather strives to maintain the progress and productive mutual interaction of various parties in such a way that overall risk of failure is reduced



Client Project Interface



Project Organisation



Suitably Qualified and Experienced

- ◆ Existing expertise within the Client organisation.
 - ◆ Health Physics
 - ◆ Characterisation
 - ◆ Surveys
 - ◆ Decontamination
 - ◆ Maintenance of monitoring equipment
 - ◆ Quality Assurance
 - ◆ Procurement

Suitably Qualified and Experienced

- ◆ Existing Expertise continued
 - ◆ Radiological protection
 - ◆ Safety Advisor?
 - ◆ Technical authors
 - ◆ Safety Report?

Development Needs

- ◆ Project Management Techniques
 - ◆ Project Reporting
 - ◆ Earned value analysis
 - ◆ Schedule monitoring/ update
 - ◆ KPIs
 - ◆ Contract Management (procurement)
 - ◆ Risk management

Training Requirements

- ◆ Decommissioning culture change
 - ◆ Finite start / end point.
 - ◆ Different use of skills in decommissioning.
- ◆ Characterisation
 - ◆ Taking Samples
 - ◆ Analysis procedures.
- ◆ Access /egress in Reactor Hall
 - ◆ During dismantling operations potential to spread contamination.

Training Requirements Contd

- ◆ Decontamination Processes
 - ◆ Operation of decontamination facility.
 - ◆ Principles of decontamination.
 - ◆ Waste minimisation.
- ◆ Waste Management Strategy
 - ◆ Waste characterisation
 - ◆ Waste packaging
 - ◆ Disposal Routes

Training Requirements Contd

- ◆ Maintenance of decommissioning facilities
 - ◆ Ventilation Systems / Monitoring Systems
 - ◆ Safety Mechanism
 - ◆ DP guage on extract systems
 - ◆ Filter change.
 - ◆ Beta in air / gamma monitors
 - ◆ Functional checks / proof tests/ calibration
 - ◆ Alarm responses
 - ◆ Ventilation DP
 - ◆ Ventilation Low flow
 - ◆ Gamma and Beta in air alarms.

Training Requirements Contd

- ◆ Operation of decommissioning facilities
 - ◆ Daily Start up procedure
 - ◆ Extract system
 - ◆ Monitoring system
 - ◆ Survey of containment
 - ◆ Shutdown procedure
- ◆ Emergency procedures
 - ◆ Industrial accident
 - ◆ Fire

Quality Assurance

- ◆ Develop Manual of Project Specific Procedures
- ◆ Quality Assurance programme
 - ◆ Quality Plans
 - ◆ Installation
 - ◆ Operations
 - ◆ Waste Management

Quality Assurance

Procedures

- ◆ Method statements
 - ◆ Install containment
 - ◆ Ventilation systems
 - ◆ Monitoring system?
- ◆ Commissioning (System performance)
 - ◆ Ventilation
 - ◆ Monitoring
 - ◆ Decommissioning tools?

Quality Assurance

Procedures

- ◆ Maintenance Procedures
 - ◆ Ventilation / extract system
 - ◆ Filter changes
 - ◆ Monitoring system
 - ◆ Functional checks (monthly)
 - ◆ Calibration (annual)
 - ◆ Dismantling equipment
 - ◆ Brokk - daily/ weekly / routine maintenance
- ◆ Operating instructions
 - ◆ Decommissioning operations
 - ◆ Free release waste removal/ packaging
 - ◆ Low level waste removal/ packaging
 - ◆ Intermediate waste removal/ packaging
 - ◆ Start up / shut down procedure

Quality Assurance

Procedures

- ◆ Health Physics Procedures
 - ◆ Sampling and analysis
 - ◆ Routine surveys
 - ◆ Waste sentencing
 - ◆ Clearance monitoring

Quality Assurance

Competency Based QA system

- ◆ Train people to do the role
- ◆ Keep training records
- ◆ Produce Role proficiency graph for personnel (RPG)
- ◆ Reduces need for abundance of procedures.

Project Schedule

Project management Tool

- ◆ Used to develop estimate
- ◆ Multi level enables project monitoring
 - ◆ Cost- Cost performance index
 - ◆ Time -schedule performance index
- ◆ Forecasting Tool
 - ◆ Forecast budget requirements
 - ◆ Resource requirements
- ◆ Tracking
 - ◆ Demonstrates impacts of any changes to activity either time or cost.

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Questions