
Engineering Project Leadership: Requirements, Design Reviews and Technical Baselines Course

12 – 16 September 2027
Muscat





Engineering Project Leadership: Requirements, Design Reviews and Technical Baselines Course

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Programme Summary

Engineering project leadership through requirements, design reviews and technical baselines is a one-week training course for engineering and technology leaders at strategic level, culminating in a technical control plan for a complex project they lead. Many technically demanding projects meet their schedules on paper yet fail at integration or acceptance because requirements drifted, interfaces were unmanaged and design reviews passed immature work. The approach applies systems engineering life cycle processes to the decisions leaders own. Mars Training Centre UK delivers this programme in engineering project leadership.

The Business Case

Late discovery of a technical problem is the most expensive way to find it. When requirements are not traced, baselines are changed informally and verification is planned at the end, defects surface during integration, testing or operation, where rework and delay multiply. Leaders who govern the technical side of delivery catch these problems at the review gates designed for them.

- Rework and Integration Cost: Falls as requirements, interfaces and design changes are traced and controlled from the start.
- Acceptance and First-Time Verification Success: Rises as verification and validation are planned against each requirement.
- Technical Risk Exposure: Reduces as immature technologies and unresolved design issues are exposed at review gates.

Principles and Evidence Base

- ISO/IEC/IEEE 15288:2023 System Life Cycle Processes: Provides the technical and technical management processes that structure Sessions 1 to 4.
- INCOSE Systems Engineering Handbook: Supplies practical guidance on requirements, architecture and verification applied in Sessions 2 and 4.
- Configuration Management and Technical Baselines: Frame how functional, allocated and product baselines are established and changed in Session 2.
- Technology Readiness Levels: Give a common scale for judging the maturity of critical technologies at the review gates in Session 3.



Intended Participants

- Leaders accountable for the technical performance of complex engineering or technology projects.
- Directors who chair design reviews and approve technical baselines and major changes.
- Heads of engineering who set requirements, interface and verification practice across programmes.
- Senior managers who must report technical maturity and risk to sponsors and boards.

The programme serves energy and utilities, defence and aerospace, transport and rail systems, and industrial technology and digital infrastructure.

Learning Outcomes

1. Participants will be able to evaluate how well a project's requirements are defined, allocated and traced.
2. Participants will be able to construct a baseline and change control approach for a technical project.
3. Participants will be able to judge readiness for a design review using entry and exit criteria and technology readiness levels.
4. Participants will be able to design a verification and validation strategy linked to the requirements.
5. Participants will be able to diagnose interface and technical risks and prioritise their treatment.
6. Participants will be able to justify a technical control plan to sponsors and project teams.

Programme Structure

Day 1: Engineering Project Leadership and the System Life Cycle

Which technical processes decide whether a complex project succeeds?

- System Life Cycle Stages and Technical Processes
- Technical Management Versus Project Management Roles
- Stakeholder Needs and Concept of Operations
- Systems Engineering Management Plan
- Technical Health Check of a Live Project

Day 2: Requirements, Traceability and Technical Baselines

How are requirements written, allocated, traced and frozen?

- Requirement Quality Attributes and Common Defects
- Requirements Allocation and Traceability Matrices
- Functional, Allocated and Product Baselines
- Configuration Identification and Change Control Boards
- Requirements Creep and Change Impact Assessment



Day 3: Design Reviews and Technical Readiness

When is a design mature enough to pass a gate?

- System Requirements, Preliminary and Critical Design Reviews
- Entry and Exit Criteria for Technical Reviews
- Technology Readiness Level Assessment
- Trade Studies and Decision Records
- Review Actions and Close-Out Discipline

Day 4: Interfaces, Verification and Technical Risk

How are integration problems prevented and technical performance proven?

- Interface Control Documents and Interface Registers
- Verification Methods: Test, Analysis, Inspection and Demonstration
- Validation Against Operational Needs
- Technical Performance Measures and Margins
- Technical Risk Identification and Burn-Down

Day 5: Applying the Technical Control Plan

How are requirements, baselines, reviews and verification combined for one project?

- Requirements and Baseline Assessment of a Participant Project
- Review Gate Schedule and Criteria
- Verification and Interface Priorities
- Peer Challenge of Technical Control Plans
- Technical Control Plan Presentation

Methodology

The programme relies on case analysis and structured exercises. Participants examine requirements sets, review packs and change records from energy, transport and technology projects, diagnose where technical control broke down and rebuild the missing controls.

- Suggested activity: Rewriting a defective requirements set and building its traceability matrix.
- Suggested activity: Running a mock preliminary design review against entry and exit criteria.
- Suggested activity: Assessing technology readiness for three critical components.



Capstone Output

Each participant completes a technical control plan for a project they lead. It sets out the requirements and traceability approach, baselines and change authority, the schedule and criteria of technical reviews, interface and verification priorities and the main technical risks, ready to agree with the sponsor and engineering team.

Frequently Asked Questions

Is engineering project leadership training suitable for directors without a systems engineering background?

Yes. It is written for engineering and technology leaders who govern complex projects. It assumes experience of technical delivery but no formal systems engineering training.

Which standards underpin engineering project leadership in this course?

It draws on ISO/IEC/IEEE 15288:2023 system life cycle processes, the INCOSE Systems Engineering Handbook, configuration management and technical baselines, and technology readiness levels.

How is the engineering project leadership technical control plan used at work?

You take back a plan for a real project defining how requirements, baselines, reviews and verification are governed.

How does engineering project leadership differ from general project management courses?

It concentrates on the technical side of delivery, requirements, design maturity and verification, rather than on schedule, cost and commercial control.