Wiring Harness Design Training Course: Routing, Bundle Sizing, Drawing Release and Build Handoff

3 – 7 January 2027
Muscat

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Ref: 905_41263 **Date:** 3 – 7 January 2027 **Location:** Muscat **Fees:** 4300 GBP

Programme Summary

Wiring harness design for electrical products and plant equipment is the subject of this one-week training course for engineering managers, design leads, electrical architects and manufacturing engineers, taught at managerial level and ending in a harness design review for one product. Routing, bundle size and drawing release decisions set cost, weight and reliability long before the first build, yet they are often left to tool operators. The programme moves from requirements to 3D routing, flattened drawings, change control and failure causes, using prepared harness data from an equipment maker and a vehicle supplier. Mars Training Centre UK delivers this programme on wiring harness design to mixed-organisation cohorts.

The Business Case

A harness is built from many small decisions that are costly to reverse once parts are ordered. Leaders who can test a routing against clearance rules, judge a drawing before release and trace the reach of a change spend less on rework and reach build with fewer surprises. The programme works on the measures below.

- Harness Cost and Weight: Fall when routing, bundle size and connector choices are compared against requirements before release.
- Build Quality: Improves when drawings, wire lists and acceptance criteria are checked together at the handoff.
- Change Rework: Is contained when the reach of each change is assessed across the whole harness family.

Principles and Evidence Base

- IPC/WHMA-A-620: The requirements and acceptance standard for cable and wire harness assemblies, applied in Sessions 1 and 3 to set acceptance criteria and review build instructions.
- CATIA V5: The 3D design environment used as the working example for routing and flattening, applied in Sessions 2 and 3 to read harness models and drawings.

Intended Participants

- Engineering managers who answer for harness cost, weight and delivery.
- Design leads who review routing models and release drawings.
- Electrical architects who define circuits, connectors and variants.
- Manufacturing engineers who receive the drawings and build the harness.

Typical settings include power equipment, oil and gas packages, vehicles and rail, and industrial machinery.

Learning Outcomes

1. Participants will be able to evaluate harness requirements against cost, weight and reliability limits.
2. Participants will be able to construct a routing and bundle sizing check from clearance and bend rules.
3. Participants will be able to diagnose gaps in a flattened drawing and wire list before release.
4. Participants will be able to prioritise engineering changes by their reach across variants.
5. Participants will be able to compare failure causes between design and build.
6. Participants will be able to justify a harness design review to a design board.

Programme Structure

Day 1: Wiring Harness Design Foundations and Requirements

What must a harness do, and who sets those requirements?

- Harness Requirements Register
- Electrical Architecture Reading
- Connector and Wire Selection Rules
- IPC/WHMA-A-620 Acceptance Reading
- Harness Cost and Weight Baseline

Day 2: 3D Routing and Bundle Sizing Decisions

How are routes and bundle diameters decided before a prototype exists?

- 3D Routing in CATIA V5
- Bend Radius and Clearance Rules
- Bundle Diameter Estimation
- Support and Clip Placement
- Routing Review Checklist

Day 3: Flattened Drawings and Manufacturing Handoff

What does the build floor need from a released harness drawing?

- Flattened Drawing Content Sheet
- Wire List and Connector Table
- Nailboard Layout Review
- Build Instruction Handoff Note
- Drawing Release Gate

Day 4: Change Control, Variants and Failure Causes

How does one design change spread through a harness family?

- Variant Family Structure
- Engineering Change Impact Matrix
- Harness Failure Cause Tree
- Supplier Build Defect Log
- Revision Control Rule

Day 5: Wiring Harness Design Review for One Product

Do the findings join into a review that a design board can approve?

- Applying the Session 1 Requirements Register
- Testing the Session 2 Routing Checklist
- Checking the Session 3 Release Gate
- Reviewing the Session 4 Impact Matrix
- Completing the Harness Design Review

Methodology

The programme is a data workshop built on prepared harness models, wire lists and drawings from an equipment maker and a vehicle supplier. Participants read routing models, check clearances, review flattened drawings and trace a change across variants, then defend the resulting review to peers acting as a design board.

- Suggested activity: Checking a routed bundle against clearance and bend radius rules.
- Suggested activity: Finding the gaps in a flattened drawing and its wire list.
- Suggested activity: Tracing one connector change across four harness variants.

Capstone Output

Each participant completes a harness design review for one product. It holds the requirements register, a routing checklist, a drawing release gate, a change impact matrix and a failure cause summary. At work it goes to the design board for approval and sets the routine for reviewing later harness releases and supplier builds.

Frequently Asked Questions

Is wiring harness design training suitable for managers who are not CATIA operators?

Yes. Wiring harness design is taught through prepared models, drawings and templates. You need responsibility for design, architecture or manufacturing decisions, but no hands-on modelling skill.

Which standard does wiring harness design rest on in this training?

Wiring harness design here rests on IPC/WHMA-A-620 for acceptance criteria, with CATIA V5 used as the working example for routing models and flattened drawings.

How is the design review from wiring harness design training used at work?

You take the harness design review to your design board, use its release gate to check drawings, and keep its change impact matrix for later releases.

How does wiring harness design differ from a programme on printed circuit board design?

Wiring harness design concentrates on routing, bundles, connectors and build handoff for cabling, while a programme on printed circuit board design concentrates on board layout and component placement.