Operational excellence

Automotive Core Tools: FMEA, MSA, SPC

Three days to master together three tools that automotive customers ask of their suppliers: FMEA to anticipate failures, MSA to check the reliability of measurements, SPC to run the process. A common thread links the three on one characteristic of your product, from risk analysis to the control plan and the control chart, using your measurement and production data.

Duration : 3 days

Objectives

1. Explain the role of FMEA, MSA and SPC in automotive quality planning and control
2. Run a process FMEA and draw from it the elements of the control plan
3. Carry out and interpret a gauge R&R study and an attribute study on inspection equipment at your site
4. Build and interpret a control chart, and calculate the capability of a stable process
5. Link the three tools on a special characteristic, from risk analysis to the reaction at the workstation

Programme

Day 1 — morning

• Core tools in automotive customers' expectations: APQP, FMEA, control plan, MSA, SPC, PPAP

• FMEA: planning, structure of the product or process, functions and requirements

• Special characteristics: identification, customer symbols, carry-over into documents

• Passing characteristics from the product FMEA to the process FMEA

Day 1 — afternoon

• Failures and risks: severity, occurrence, detection, action priority

• Optimisation, re-assessment and building the control plan from the FMEA

• Exercise: process FMEA of a step in your manufacturing

• End-of-day quiz

Day 2 — morning

• MSA: sources of measurement error, bias, linearity, stability

• Gauge R&R study: design, execution, calculation, distinct categories, decision

• Attribute studies for visual inspections and gauges

• Exercise: gauge R&R study on an instrument at your site

Day 2 — afternoon

• SPC: variation, common and special causes, rational subgroups

• Variables and attribute charts: choice, construction, calculation of limits

• Chart signals and operator reaction

• Exercise: control chart on data from your line

Day 3 — morning

• Capability: Cp, Cpk, Pp, Ppk, and the stability needed before calculating

• Preliminary capability at launch, then follow-up in series production

• What an auditor checks: consistency between FMEA, control plan, MSA studies and charts

• Frequent gaps found in supplier audits and at approval

Day 3 — afternoon (workshop)

• Workshop: one special characteristic of your product followed from the FMEA to the control plan, the MSA study and the chart

• Cross-review of work between groups

• Action plan to align your existing documents

• Knowledge test on the three tools and presentation

Teaching methods

• Common thread on one characteristic of your product over the three days
• Real measurements and production data from your lines for MSA and SPC
• Review of existing documents at your site: FMEAs, control plans, study reports
• Exercises in a spreadsheet, then reading results from statistical software
• Quiz at the end of each day and a final test

Assessment and documents

Daily quizzes, knowledge test and a practical exercise on the FMEA, MSA, SPC chain; end-of-course evaluation at D+1. Numbered training certificate, verifiable online, for each participant; the company receives the training report and the workshop output.

Bilingual materials for every participant; each classroom course comes with its digital twin on OmniLearn.

Good to know

Each tool is also available as a separate module: « Product and Process FMEA » (2 days), « Measurement Systems Analysis (MSA, Gauge R&R) » (1 day) and « Statistical Process Control (SPC) » (2 days). APQP and PPAP have dedicated courses.

Practical information

Duration	3 days
Audience	Quality, methods and production engineers and technicians, supplier quality, project managers at automotive suppliers
Prerequisites	Ability to use a spreadsheet; experience in production or quality
Group size	Groups of 6 to 12 participants, in-company
Format	In-company, face to face on your site
Language	French, Darija or English; bilingual materials
Funding	OFPPT special training contracts (TFP), GIAC, Maroc PME: we prepare the applications with you, at no extra cost.
Programme customisation	Programme adapted to your procedures, your equipment and your audience

Frequently asked questions

Why group FMEA, MSA and SPC?
Because they follow on from one another: FMEA designates the characteristics to control, MSA checks that we know how to measure them, SPC runs them in production. Learning them together brings out the inconsistencies auditors find between these documents.

What is the difference with the separate modules?
The separate modules go further on each tool, in five days in total. This three-day path covers the essentials of each and stresses the links between them, for teams that must respond quickly to an automotive customer's requirements.

Do we need to work in automotive?
No. Customers in electrical, plastics, packaging or metalworking also ask their suppliers for these tools. Automotive-specific requirements are flagged throughout the course.

Are the automotive reference manuals included?
No, they are obtained from their publishers. Participants receive the course materials and ACG's templates, in French or English, which explain the method without reproducing those manuals.

Can this course be funded?
It can appear in the company's training plan under special training contracts, according to the OFPPT rules in force. ACG prepares the file with you; coverage depends on your situation.