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TRAINING COURSES

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Offering customized solutions through knowledge and experience to the industry looking to transcend the standards

SPC Consulting Group is an international company with a worldwide presence, providing consulting and training services not only to manufacturing companies, but to other kind of industries too.

Our expertise is focused on different areas, such as quality systems and continuous improvement. Our customers in America, Mexico and Latin America guarantee our services.

Our seminars are designed by professional subject experts and taught by the most capable instructors.

All our consultants have gone through a rigorous validation process to become part of SPC Consulting Group. All of them are qualified professionals, we assure that they are tool practitioners before trainers. All of them have great and vast field expertise.

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313 654 9545
info@spc-us.com

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QUALITY ASSURANCE



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TRAINING COURSES CATALOGUE

INTERNAL AUDITOR



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ISO 9001:2026

INTERNAL AUDITOR

Objective:

At the end of the course the participant will acquire the theoretical concepts required to audit the automotive quality management system ISO 9001:2026, will understand the importance of preparation previous to the audit and will be able to write effective audit reports.

Prerequisites:

- Basic knowledge of ISO 9001:2026 (desirable)
- Knowledge of the internal audits process in your organization (desirable)

Duration:

16 hours

Day 1 - ISO 9001:2026 Overview

Introduction to Quality Management System

- Terms and definitions
- Quality management principles
- Process approach
- Risk-based thinking
- Climate change considerations

Interpretative Review ISO 9001:2026

- Interpretative exercises
- Application exercises
- Documentary audit

Competencies for Internal Auditor

- Knowledge required
- Skills required

Day 2 - Auditing Management Systems

- Terms and definitions
- Principles of auditing
- Audit program
  + Risks and opportunities
  + Roles and responsibilities
- Preparing audit activities
- Audit plan
- Opening meeting
- Audit implementation
- Audit methods
- Audit findings
- Audit report
- Closing meeting
- Auditor competence

INTERPRETATION



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ISO 9001:2026

INTERPRETATION OF REQUIREMENTS

Objective:
The participant will gain a detailed understanding of the new requirements of ISO 9001:2026, be able to apply them within the context of their organization, and take a proactive role in their implementation.

Prerequisites:
- Knowledge of ISO 9001:2015 (preferred)
- Work experience within their organization

Duration:
16 hours

Introduction and Definitions

Quality Management Principles

ISO 9001:2026 Structure

Process Approach

Risk-Based Thinking

4.0 Understanding the Organization
- Context of the organization
- Interested parties
- QMS scope
- QMS processes
- Climate change considerations

5.0 Leadership
- Leadership and commitment
- Quality policy
- Roles, responsibilities, and authorities

6.0 QMS Planning
- Risks and opportunities
- Quality objectives, definition, and management
- Planning of changes

7.0 Support
- Resources
- Competence
- Awareness
- Communication
- QMS documented information

8.0 Production
- Operational planning and control
- Requirements for products and services
- Design and development of products and services
- Externally provided products / services
- Production and service provision
- Release of products and services
- Control of nonconforming outputs

9.0 Performance Evaluation
- Monitoring, measurement, analysis, and evaluation
- Internal audits
- Management review

10.0 Improvement
- Nonconformity and corrective actions
- Continual improvement



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ISO 9001:2026

INTERNAL AUDITOR DEVELOPMENT BASED ON ISO 19011:2026

Objective:

Upon completing the course, the participant will have a detailed understanding of the requirements of ISO 9001:2026. They will be able to prepare effective audit reports that promote improvement within the organization and understand the importance of preparation prior to an audit.

Prerequisites:

- Work experience within their organization

Duration:

24 hours

Days 1 and 2: Detailed Review of ISO 9001:2026

- Introduction and definitions
- Quality management principles
- ISO 9001:2026 structure
- Process approach
- Risk-based thinking

4.0 Understanding the Organization

- Context of the organization
- Interested parties
- QMS scope
- QMS processes
- Climate change considerations

5.0 Leadership

- Leadership and commitment
- Quality policy
- Roles, responsibilities, and authorities

6.0 QMS Planning

- Risks and opportunities
- Quality objectives, definition, and management
- Planning of changes

7.0 Support

- Resources
- Competence
- Awareness
- Communication
- QMS documented information

8.0 Production

- Operational planning and control
- Requirements for products and services
- Design and development of products and services
- Externally provided products / services
- Production and service provision
- Release of products and services
- Control of nonconforming outputs

9.0 Performance Evaluation

- Monitoring, measurement, analysis, and evaluation
- Internal audits
- Management review

10.0 Improvement

- Nonconformity and corrective actions
- Continual improvement

Days 2 and 3: Management System Auditing in Accordance with ISO 19011:2026

- Terms and definitions
- Auditing principles
- Audit program
  - + Risks and opportunities
  - + Roles and responsibilities
- Audit preparation
- Audit plan
- Initiating the audit
- Conducting the audit
- Audit methods
- Audit findings
- Audit report
- Closing the audit
- Internal auditor performance



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ISO 9001:2026

LEAD AUDITOR

Objective:

Upon completing the course, the participant will understand the theoretical concepts of managing audit plans and programs for the ISO 9001:2026 quality management system, be able to prepare effective audit reports that promote improvement within the organization, and understand the importance of the audit execution and control stages.

Prerequisites:

- Work experience within their organization

Duration:

32 hours

Quality Management System Fundamentals

- Terms and definitions
- Quality management principles
- Management system requirements

Process Approach and Risk-Based Thinking

- Process determination and auditing
- Risk analysis

Overview of ISO 9001:2026

- Understanding the organization
- Leadership
- QMS planning
- Support
- Production
- Performance evaluation
- Improvement

Management System Auditing in Accordance with ISO 19011:2026

- Terms and definitions
- Auditing principles
- Audit program
- Risks and opportunities
- Roles and responsibilities
- Audit preparation
- Audit plan
- Initiating the audit
- Conducting the audit
- Audit methods
- Audit findings
- Audit report
- Closing the audit
- Internal auditor performance

INTERNAL AUDITOR



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IATF 16949:2016

INTERNAL AUDITOR

Objective:

At the end of the course, the participant will acquire the theoretical concepts required to audit the automotive quality management system IATF 16949:2016, understand the importance of preparation prior to the audit, and be able to write effective audit reports.

Prerequisites:

- Knowledge of IATF 16949:2016
- Knowledge of ISO 19011:2026 (desirable)
- Work experience in your organization

Duration:

16 hours

Day 1 - IATF 16949:2016 Overview

Introduction to Quality Management System

- Terms and definitions
- Quality management principles
- Process approach
- Risk-based thinking

Interpretative review IATF 16949:2016

- Interpretative exercises
- Application exercises
- Documentary audit

Competencies for Internal Auditor

- Knowledge required
- Skills required

Sector and Customer-Specific Requirements

- AIAG handbook
- IATF portal
- Customer handbook

Day 2 - ISO 19011:2026 Guidelines for Auditing Management System

- Terms and definitions
- Principles of auditing
- Audit programme
  + Risks and opportunities
  + Roles and responsibilities
- Audit preparation
- Audit plan
- Opening meeting
- Audit Implementation
- Audit methods
- Audit findings
- Audit report
- Closing meeting
- Internal auditor competence

AWARENESS



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IATF 16949:2016

REQUIREMENTS AWARENESS

Objective:

At the end of the course, the participant will understand the most relevant changes in the IATF 16949:2016 standard, identify the new required roles and responsibilities, and understand the importance of top management leadership and commitment.

Prerequisites:

- Work experience in your organization

Duration:

8 hours

Introduction to IATF 16949:2016

- What is quality?
- Why the change?
- Objectives of IATF 16949:2016
- Related standards

Systemic Changes

- Quality management principles
- High-level structure
- Process map

High Impact Changes

- 4.1 Context of the organization
  + SWOT / CAME analysis
- 4.2 Interested parties
- 4.4 Process approach
  + Process approach diagram
  + Process owners
  + Effectiveness and efficiency
- 5.0 Leadership
  + Commitment
  + Roles, responsibilities and authorities
- 6.1 Risk-based thinking
  + Risk analysis
  + Preventive actions
  + Contingency plans
- 7.5 Documented information

Specific Normative Changes

- 4.4.1.2 Product safety
- 5.1.1.1 Corporate responsibility
- 7.1.2 People
- 7.1.3.1 Manufacturing feasibility
- 7.2.3 Auditor competency
- 8.3.2.3 Development of products with embedded software
- 8.4 Externally provided processes, products and services
- 8.4.2.3 Supplier quality management system development
- 8.4.2.4.1 Second-party audits
- 8.5.1.5 Total productive maintenance
- 8.5.6.1.1 Process controls for temporary changes
- 8.7.1.4 Control of reworked product
- 8.7.1.5 Control of repaired product
- 9.2.2.2 Quality management system audit
- 9.3.2 Management review inputs
- 10.2.5 Warranty management system

RISK MANAGEMENT



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IATF 16949:2016

RISK MANAGEMENT

Objective:

At the end of the course, the participant will be able to identify the risks present in the processes of the IATF 16949:2016 Quality Management System, following the guidelines of ISO 31000:2018 for risk management, use basic risk analysis tools to determine the best control strategy, and understand the importance of integrating controls as part of the processes.

Prerequisites:

- Knowledge of ISO 31000:2018 (desirable)
- Knowledge of IATF 16949:2016 (desirable)
- Work experience in your organization

Duration:

16 hours

Risk Management Introduction

- Terms and definitions
- ISO 31000 family of standards
- Risk management principles

Framework

- Leadership and commitment
- Integration
- Design
  - + Understanding the organization and its context
  - + Commitment to risk management
  - + Roles, authorities, responsibilities and obligations
  - + Allocation of resources
  - + Communication and consultation
- Implementation
- Evaluation
- Improvement
  - + Adaptation
  - + Continuous improvement

Risk Management Process

- Communication and consultation
  - + Relevant interested parties and their requirements
- Scope, context and criteria
  - + Scope definition
  - + Internal and external context
    - - SWOT / CAME analysis
  - + Risk criteria
    - - Probability
    - - Consequences
    - - Risk levels
- Risk assessment
  - + Risk identification
    - - Process approach diagram
  - + Risk analysis
    - - Ishikawa diagram
    - - 5 Whys
    - - What-if technique
    - - Risk levels
  - + Risk evaluation
- Risk treatment
  - + Risk treatment options
  - + Risk treatment plans
- Monitoring and review
- Recording and reporting

INTERPRETATION OF REQUIREMENTS



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IATF 16949:2016

INTERPRETATION OF REQUIREMENTS

Objective:

The participant will gain a detailed understanding of the requirements of the IATF 16949:2016 standard, be able to apply them to the context of their organization, and assume a proactive role in their implementation.

Prerequisites:

- Knowledge of the ISO 9001:2026 standard (desirable)
- Work experience in your organization

Duration:

16 hours

Introduction and Definitions

Quality Management Principles

IATF 16949:2016 Structure

Process Approach

Risk-Based Thinking

4.0 Understanding the Organization

- Context of the organization
- Interested parties
- Scope of the QMS
- QMS processes

5.0 Leadership

- Leadership and commitment
- Quality policy
- Roles, responsibilities, and authorities

6.0 QMS Planning

- Risks and opportunities
- Quality objectives, definition and management
- Planning for changes

7.0 Support

- Resources
- Competence
- Awareness
- Communication
- Documented information of the QMS

8.0 Operation

- Operational planning and control
- Requirements for products and services
- Design and development of products and services
- Externally provided processes, products and services
- Production and service provision
- Release of products and services
- Control of nonconforming outputs

9.0 Performance Evaluation

- Monitoring, measurement, analysis, and evaluation
- Internal audits
- Management review

10.0 Improvement

- Nonconformity and corrective actions
- Continuous improvement



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ISO 14001:2026
INTERNAL AUDITOR

Objective:
At the end of the course, the participant will acquire the theoretical concepts required to perform internal audits of the ISO 14001:2026 environmental management system based on ISO 19011:2026 guidelines, understand the importance of preparation prior to the audit, and be able to write effective audit reports.

Prerequisites:
- Knowledge of ISO 14001:2026 (desirable)
- Knowledge of ISO 19011:2026 (desirable)
- Environmental legislation (desirable)
- Work experience in your organization

Duration:
16 hours

Day 1 - Basic Understanding of ISO 14001:2026

Introduction to Environmental Management System
- Terms and definitions
- Objectives of the management system
- Success factors
- Management system model
- Climate change considerations

Interpretative Review of ISO 14001:2026
- Interpretative exercises
- Application exercises
- Documentary audit

Competence of the Internal Auditor
- Knowledge required
- Skills required

Day 2 - Auditing Management Systems based on ISO 19011:2026
- Terms and definitions
- Principles of auditing
- Audit program
  + Risks and opportunities
  + Roles and responsibilities
- Audit preparation
- Audit plan
- Opening meeting
- Audit implementation
- Audit methods
- Audit findings
- Audit report
- Closing meeting
- Internal auditor competence



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ISO 14001:2026

INTERPRETATION OF REQUIREMENTS

Objective:

The participant will learn about the most significant changes to ISO 14001:2026, identify the new roles and responsibilities required, and understand the importance of sustainable development, the identification and evaluation of environmental conditions (climate change, pollution levels, biodiversity, etc.) that may affect the organization's context, and leadership and commitment from top management.

Prerequisites:

- Knowledge of ISO 14001:2015
- Work experience within their organization

Duration:

16 hours

Introduction and Definitions

Objectives of an Environmental Management System

ISO 14001:2026 Structure

Process Approach

Risk- and Opportunity-Based Thinking

4.0 Context of the Organization

- Understanding the organization and its context
- Needs and expectations of interested parties
- EMS scope
- EMS processes
- Consideration of environmental conditions (climate change, pollution levels, biodiversity, etc.)

5.0 Leadership

- Leadership and commitment
- Environmental policy
- Roles, responsibilities, and authorities

6.0 EMS Planning

- Risks and opportunities
- Environmental aspects
- Compliance obligations
- Environmental objectives
- Planning of changes

7.0 Support

- Resources
- Competence
- Awareness
- Communication
- EMS documented information

8.0 Operation

- Operational planning and control
- Emergency response

9.0 Performance Evaluation

- Monitoring, measurement, analysis, and evaluation
- Evaluation of compliance
- Internal audits
- Internal audit program
- Management review

10.0 Improvement

- Continual improvement
- Nonconformity and corrective action



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ISO 14001:2026

INTERPRETATION OF REQUIREMENTS + INTERNAL AUDITOR

Objective:
The participant will gain a detailed understanding of the new requirements of ISO 14001:2026 and be able to interpret them during the practical conduct of an internal audit.

Prerequisites:
- Knowledge of ISO 14001:2026
- Knowledge of ISO 19011:2026
- Work experience within their organization

Duration:
24 hours

Days 1 and 2 – Detailed Review of ISO 14001:2026

Introduction and Definitions

Objectives of an Environmental Management System

ISO 14001:2026 Structure

Process Approach

Risk- and Opportunity-Based Thinking

4.0 Context of the Organization
- Understanding the organization and its context
- Needs and expectations of interested parties
- EMS scope
- EMS processes
- Consideration of environmental conditions (climate change, pollution levels, biodiversity, etc.)

5.0 Leadership
- Leadership and commitment
- Environmental policy
- Roles, responsibilities, and authorities

6.0 EMS Planning
- Risks and opportunities
- Environmental aspects
- Compliance obligations
- Environmental objectives
- Planning of changes

7.0 Support
- Resources
- Competence
- Awareness
- Communication
- EMS documented information

8.0 Operation
- Operational planning and control
- Emergency response

9.0 Performance Evaluation
- Monitoring, measurement, analysis, and evaluation
- Evaluation of compliance
- Internal audits
- Internal audit program
- Management review

10.0 Improvement
- Continual improvement
- Nonconformity and corrective action

Day 3 – Management System Auditing in Accordance with ISO 19011:2026

- Terms and definitions
- Auditing principles
- Audit program
- Risks and opportunities
- Roles and responsibilities
- Audit preparation
- Audit plan
- Initiating the audit
- Conducting the audit
- Audit methods
- Audit findings
- Audit report
- Closing the audit
- Internal auditor performance



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ISO 14001:2026
LEAD AUDITOR

Objective:
Upon completing the course, the participant will understand the theoretical concepts involved in managing audit plans and programs for the ISO 14001:2026 quality management system, be able to prepare effective audit reports that promote improvement within the organization, and understand the importance of the audit execution and control stages.

Prerequisites:
- Work experience within their organization

Duration:
32 hours

Environmental Management System Fundamentals
- Terms and definitions
- Environmental management principles
- Environmental management system requirements

Process Approach and Risk- and Opportunity-Based Thinking
- Process determination and auditing
- Risk and opportunity analysis

Overview of ISO 14001:2026
- Context of the organization
- Leadership
- EMS planning
- Support
- Operation
- Performance evaluation
- Improvement

Management System Auditing in Accordance with ISO 19011:2026
- Terms and definitions
- Auditing principles
- Audit program
  + Risks and opportunities
  + Roles and responsibilities
- Audit preparation
- Audit plan
- Initiating the audit
- Conducting the audit
- Audit methods
- Audit findings
- Audit report
- Closing the audit
- Internal auditor performance



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VDA 6.3

PROCESS AUDIT – 4th EDITION, JANUARY 2023

Objective:

At the end of the course, the participant will acquire the theoretical concepts required to perform process audits based on VDA 6.3 requirements, understand the importance of preparation prior to the audit, and be able to write effective audit reports that promote improvement within the organization.

Prerequisites:

- Process approach (desirable)
- Risk-based thinking (desirable)
- Internal auditor IATF 16949:2016 (desirable)
- Work experience in your organization

Duration:

24 hours

Introduction

- What is VDA?
- VDA standards family
- Other related VDA standards
- VDA 6.3 auditor qualification
- Process approach
- Risk-based thinking

VDA 6.3 Requirements

- Product and process design and development
- Supplier management
- Analysis of production processes
- Customer support and satisfaction
- After-sales services

VDA 6.3 Audit Planning and Execution

- Audit planning
- Preparation
- Execution
- Numerical evaluation of findings
- Presentation of results
- Final evaluation and closure: corrective actions
- Module VI: Potential analysis (Chapter P1)

Questionnaire

- Questionnaire overview
- Project management (P2)
- Planning of product and process development (P3)
- Implementation of product and process development (P4)
- Supplier management (P5)
- Serial production (P6)
- Customer support, customer satisfaction and service provision (P7)
- Services (PD)

Evaluation System

- Scoring and evaluation formulas
- Evaluation of elements
- Evaluation of transport and handling of parts
- Overall classification
- Evaluation by production lines or process stages

VDA 6.3 and Other References

- Relationship with FORMEL Q
- Relationship with IATF 16949:2016
- VDA 6.5 Product audits



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VDA 6.5

PRODUCT AUDIT – 3rd EDITION, MARCH 2020

Objective:
At the end of the course, the participant will acquire the theoretical concepts required to perform product audits based on VDA 6.5 requirements, understand the importance of preparation prior to the audit, and be able to write effective audit reports that promote improvement within the organization.

Prerequisites:
- Process approach (desirable)
- Risk-based thinking (desirable)
- Internal auditor IATF 16949:2016 (desirable)
- Work experience in your organization

Duration:
8 hours

Introduction

Content

- VDA model
- Introduction to product audits
- Objective and scope of application
- Audit program
- Product audit sequence
- Audit planning
- Characteristics and specifications
- Verification methods
- Parts and their identification
- Transportation and packaging
- Performing the product audit
- Documentation
- Corrective actions
- Auditor competence

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313 654 9545
info@spc-us.com

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AUTOMOTIVE TOOLS





APQP & CONTROL PLAN 2024
SPC AIAG-VDA 2026

MINITAB REQUIRED

AIAG VDA

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INCLUDES NEW SPC AIAG-VDA

CORE TOOLS

APQP+PFMEA+SPC+MSA+CP+PPAP

Objective:

The participant will understand the fundamental concepts of the automotive Core Tools, apply them through practical examples in accordance with AIAG manuals, and understand the importance of quality planning in ensuring product quality and regulatory compliance.

Prerequisites:

- Basic knowledge of IATF 16949:2016 (desirable)
- Work experience in manufacturing environments
- Basic knowledge of statistics
- Laptop with Minitab software (recommended)

Duration:

24 hours

Day 1: APQP – Advanced Product Quality Planning 3rd Edition, 2024

- Introduction to APQP
- Changes in the 2024 version
- Program management
  - + Risk assessment and mitigation
  - + Gate management
  - + KPIs related to APQP
- Sourcing
  - + Increasing focus on sourcing
  - + Checklist
  - + Gate management for sub-suppliers
- Clarification / detail
  - + Change management during APQP
  - + Capacity planning
  - + Traceability
  - + Error proofing and mistake proofing
- Relation to IATF 16949:2016
- Product quality planning cycle
  - + Gates 0-5

FMEA – Failure Mode and Effects Analysis 1st Edition, 2019

- Introduction to FMEA (AIAG-VDA)
- 7-step approach
- Planning and preparation
- Structure analysis
- Functional analysis
- Failure analysis
- Risk analysis
- Prevention, detection and containment
- Action Priority (AP)
- Practical example of PFMEA

Day 2: SPC AIAG-VDA – Statistical Process Control, 1st Edition, 2026

- Introduction to SPC
- Relationship with IATF 16949:2016
- Measures of central tendency and dispersion
- Elements of a control chart
- Common and special causes
- Variable data control charts
  - + X-R Chart
  - + I-MR Chart
- Attribute control charts
  - + p Chart
  - + u Chart
- Activity
- Capability study (Cp, Cpk, Pp, Ppk)
- Sixpack – Capability analysis in Minitab
- Activity

Day 2: MSA – Measurement Systems Analysis 4th Edition, 2010

- Introduction to measurement systems
- Relation to IATF 16949:2016
- Elements of a measurement system
- Repeatability and reproducibility
- Gage R&R study – design and execution
- Gage R&R study in Minitab
- Interpretation of Gage R&R results
- Attribute measurement systems
- Activity

Day 3: Control Plan 1st Edition, 2024

- Changes in the 2024 version
- Feature management
  - + Special characteristics
  - + Transfer characteristics
- Addressing common weaknesses
  - + Error-proofing
  - + Volume-based sampling
  - + Reaction plan responsible
- Clarified expectations
  - + Directed suppliers
  - + Safe launch
- Relation to IATF 16949:2016
- Activity

Day 3: PPAP – Production Part Approval Process 4th Edition, 2006

- Introduction to PPAP
- Relation to IATF 16949:2016
- PPAP submission
- Significant production run
- 18 PPAP requirements
- PPAP levels
- PSW – Part Submission Warrant
- Activity



SPC consulting group

INCLUDES NEW SPC AIAG-VDA

CORE TOOLS

APQP+PFMEA+SPC+MSA+CP+PPAP

Objective:

The participant will gain an in-depth understanding of the Core Tools, apply them in real situations within their organization, and understand the importance of planning in ensuring product quality and regulatory compliance.

Requirements:

- Basic knowledge of IATF 16949:2016 (desirable)
- Work experience in manufacturing environments
- Basic knowledge of statistics
- Laptop with Minitab software (recommended)

Duration:

40 hours

Day 1: APQP Advanced Product Quality Planning – 3rd Edition, 2024

- Introduction to APQP
- Changes in the 2024 version
- Program management
  - + Risk assessment and mitigation
  - + Gate management
  - + KPIs related to APQP
- Sourcing
  - + Increased focus on sourcing
  - + Checklist
  - + Gate management for sub-suppliers
- Clarification / detail
  - + Change management during APQP
  - + Capacity planning
  - + Traceability
  - + Error proofing and mistake proofing
- Relation to IATF 16949:2016
- Product quality planning cycle
  - + Gates 0–5

Day 2: PFMEA AIAG-VDA 1st Edition, 2019

- Introduction to FMEA (AIAG-VDA)
- Relation to IATF 16949:2016
- FMEA model
- Failure mode, effect and cause
- Severity, occurrence and detection
- Prevention, detection and containment
- Action Priority (AP)
- Practical example of PFMEA

Day 3: SPC AIAG-VDA – Statistical Process Control, 1st Edition, 2026

- Introduction to SPC
- Relationship with IATF 16949:2016
- Dispersion measures exercises
- Process variation analysis
- Elements of a control chart
- Common and special causes
- Statistical stability
- Calculation of control limits
- Sample size and frequency
- Variable data control charts
  - + X-R Chart – Practical case
  - + I-MR Chart – Practical case
- Attribute control charts
  - + p Chart – Practical case
  - + u Chart – Practical case
- Capability analysis (Cp, Cpk, Pp, Ppk)
- Preliminary study vs. full study
- Sixpack – Capability analysis in Minitab

Day 4: MSA Measurement Systems Analysis – 4th Edition, 2010

- Introduction to measurement systems
- Relation to IATF 16949:2016
- Elements of a measurement system
- Resolution, bias, stability and linearity
- Repeatability and reproducibility
- Gage R&R study – design and execution
- Range method vs ANOVA method
- Gage R&R study in Minitab
- Interpretation of Gage R&R results
- Attribute measurement systems
- Kappa index calculation (practical case)
- Attribute Agreement Analysis in Minitab
- Interpretation of attribute analysis

Day 5: Control Plan 1st Edition, 2024

- Changes in the 2024 version
- Feature management
- + Special characteristics
- + Transfer characteristics
- Addressing common weaknesses
  - + Error-proofing
  - + Volume-based sampling
  - + Reaction plan responsible
- Clarified expectations
  - + Directed suppliers
  - + Safe launch
- Relation to IATF 16949:2016
- Activity

Day 5: PPAP Production Part Approval Process – 4th Edition, 2006

- Introduction to PPAP
- Relation to IATF 16949:2016
- PPAP submission
- Responsibilities and authorities
- Significant production run
- 18 PPAP requirements (detailed)
- PPAP levels
- PSW – Part Submission Warrant
- Customer notification
- Record retention



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APQP

ADVANCED PRODUCT QUALITY PLANNING – 3RD EDITION, MARCH 2024

Objective:
Understand and interpret the five phases of APQP (3rd Edition) to properly implement or audit the process throughout the automotive supply chain.

Intended for:
- Engineering, quality, manufacturing, purchasing, and automotive supply chain professionals

Prerequisites:
- Basic knowledge of IATF 16949:2016 (preferred)
- Knowledge of your organization's control plans
- Work experience within your organization

Duration:
8 hours

Includes:
- Participant manual
- AIAG forms and checklists
- Integrated practical case study

Certificate of participation

Introduction
- Importance of APQP
- Relation to IATF 16949 and Core Tools
- PDCA cycle vs APQP

APQP Fundamentals
- Cross-functional team and process owner
- Supplier selection (sourcing)
- High-risk supplier evaluation
- Gate management (Gates 0–5)

Phase 1 – Planning and Definition
- Voice of the customer (VOC)
- Business plan / Benchmark
- Product / Process assumptions
- Design, reliability, and quality goals
- Capacity planning
- Change management
- Metrics and risk mitigation
- Management support

Phase 2 – Product Design
- Design FMEA / IMDS
- Design for Manufacturability and Assembly
- Prototype build
- DVP&R – Design Verification Plan & Report
- Design review
- Special product characteristics
- Technical specification and feasibility commitment
- Management support

Phase 3 – Process Design
- Packaging specification
- Product / Process QMS review
- Process flow diagram
- Process FMEA
- Pre-launch Control Plan
- Process definition and instructions
- Measurement Systems Analysis Plan
- Process capability plan
- Management support

Phase 4 – Product and Process Validation
- Significant production run
- MSA – Measurement System Analysis
- Dimensional report
- Part approval (PPAP) – PSW sign-off
- Production test validation
- Packaging evaluation
- Production Control Plan
- Management support

Phase 5 – Feedback and Improvement
- Variation reduction
- Customer satisfaction
- Improved delivery and service
- Lessons learned and best practices
- Management support

Workshop: Integrated Case Study
- Activities for each phase and an applied case study



AIAG

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PPAP

PRODUCTION PART APPROVAL PROCESS

Objective:
The participant will know in detail the 18 requirements of a PPAP, will understand which changes should be notified to the client and will be able to identify when a PPAP is complete and meets the AIAG guidelines.

Prerequisites:
- Basic knowledge of IATF 16949:2016 (desirable)
- Experience in manufacturing environments
- Knowledge of the production approval process

Duration:
8 hours

PPAP - Production Part Approval Process (4th Edition)

Introduction
- Importance of PPAP
- Relation to IATF 16949:2016
- When is PPAP required?
- Who is responsible for PPAP?

18 PPAP Requirements
- Significant production run
- Design records
  + IMDS – International Material Data System
  + Marking of polymeric parts
- Authorized engineering change documents
- Customer engineering approval
- Design FMEA
- Process flow diagram
- Process FMEA
- Control Plan
- MSA – Measurement System Analysis
- Dimensional results
- Records of material and performance tests
- Initial process studies (Cp, Cpk, Pp, Ppk)
- Qualified laboratory documentation
- Appearance Approval Report (AAR)
- Sample production parts
- Master sample
- Checking aids
- Customer-specific requirements (CSR)
- PSW – Part Submission Warrant

Customer notification

PPAP submission levels

PPAP disposition

Record retention



AIAG

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PFMEA AIAG-VDA

PROCESS FAILURE MODE AND EFFECTS ANALYSIS

Objective:
To understand how to use and develop the FMEA process in order to identify and reduce risks in products and processes.

Prerequisites:
• Basic knowledge of the process of product design and/or manufacturing processes

Duration:
16 hours

Introduction
- Purpose and description
- Objectives and boundaries
- Integration of FMEA into the company
- Project planning
- PFMEA methodology

Execution of Process FMEA (PFMEA)
- 1st Step: Planning and Preparation
  + Project Identification and boundaries
  + Project plan
  + Process FMEA Header
- 2nd Step: Structure Analysis
  + Process Flow Diagram
  + Structure Tree
- 3rd Step: Functional Analysis
  + Functions
  + Requirements (characteristics)
  + Visualization of functional relationships
- 4th Step: Failure Analysis
  + Failure
  + The Failure Chain
  + Failure effects
  + Failure modes
  + Failure causes
  + Failure analysis
  + DFMEA–PFMEA relationship
- 5th Step: Risk Analysis
  + Current Prevention / Detection Controls
  + Evaluations
  + Severity
  + Occurrence
  + Detection
  + Action Priority (AP)
- 6th Step: Optimization
  + Purpose
  + Assignment of Responsibilities
  + Status of Actions
  + Assessment of action Effectiveness
  + Continuous improvement
- 7th Step: Results Documentation
  + Purpose
  + PFMEA Report

Sample FMEA Form Sheets
- Form C: Standard PFMEA format
- Forms D / E / F / G: Alternative PFMEA formats
- View B: Software version

Practice – Conducting a PFMEA



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MSA

MEASUREMENT SYSTEM ANALYSIS

Objective:

The participant will know the different studies carried out on variable data and attribute data measurement systems, will be able to apply statistical methods for its analysis and interpretation, and will recognize the importance of having reliable measurement systems.

Prerequisites:

- Basic knowledge of IATF 16949:2016 (desirable)
- Experience in manufacturing environments
- Knowledge of the products and processes in your organization
- Laptop with Minitab software

Duration:

16 hours

MSA – Measurement System Analysis (4th Edition)

Introduction

- Importance of MSA
- Relation to IATF 16949:2016
- When is MSA required?
- Who is responsible for MSA?

Concepts and definitions

Basic Statistics

- Central tendency measures
- Measures of dispersion

Resolution

- Required resolution calculation
- Selection of the measurement instrument

Variation in measurement systems

- Effects on product measurement
- Effects on process measurements

Accuracy vs Precision

Bias Study

- Practical exercise
- Minitab – Bias Study
- Causes of excessive bias

Linearity Study

- Practical exercise
- Minitab – Linearity Study
- Causes for linearity error

Stability Study

- Practical exercise
- Minitab – Control Charts
- Causes of instability

Gage R&R Study - Repeatability and Reproducibility

- Practical exercise
- Average and range method
- ANOVA method
- Minitab – Crossed Gage R&R
- Results interpretation
- NDC – Number of Distinct Characteristics
- Corrective actions

Attribute Measurement Systems Study

- Practical exercise
- Kappa index
- Crosstabulation
- Effectiveness of the measurement system
- Miss rate, false alarm rate
- Minitab - Attribute agreement analysis
- Corrective actions



MINITAB REQUIRED

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SPC AIAG & VDA

STATISTICAL PROCESS CONTROL - 1ST EDITION, 2026

Objective:

The participant will gain a detailed understanding of the new changes introduced in the AIAG & VDA 2026 Statistical Process Control Manual, as well as the knowledge required to support the effective implementation of SPC within organizations.

Prerequisites

- Basic statistical concepts
- Interpretation of technical drawings
- Process flow diagram

Duration:

16 hours

General Information

Scope
- General AIAG VDA approach

Terms and Definitions
- Table with general definitions of terms used in SPC implementation

Proactive Prevention over Reactive Detection
- Quality Assurance
- Quality Control

Process Improvement and Control
- PDCA
- Process characteristics
- Control loops

Requirements for SPC Application
- Quality Management System
- Requirements to be met
- Interpretation of design, measurement, and production tolerances

OCAP – Out of Control Action Plan
- Approach
- Example

Roles and Competencies
- Description of roles
- Qualification matrix
- Minimum competency requirements

Difference Between Performance and Capability
- P and C Indices
- Pn/Pmk, Pp/Ppk, Cp/Cpk
- Production process capability
- Outliers
- Summary table with target values

Calculation of Capability Indices
- Data distribution analysis
- General geometric method
- Normal distribution
- Box-Cox / Johnson transformations
- One-sided tolerance limits

Machine Performance
- Data distribution analysis
- Preliminary observation
- Preparation
- Machine performance scheme

Distribution Models

Control Charts

Software Application

SPC Documentation

Traceability



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CONTROL PLAN

1ST EDITION, MARCH 2024

Objective:

The participant will understand the elements that make up a Control Plan, will be able to interpret it for proper implementation or auditing, and will recognize the importance of having a concise Control Plan focused on the relevant product and process characteristics.
The changes and guidelines from the new Control Plan manual will also be reviewed.

Prerequisites:

- Basic knowledge of IATF 16949:2016 (desirable)
- Knowledge of Control Plans within your organization
- Work experience within your organization

Duration:

8 hours

Introduction

- Importance of the Control Plan
- Relation to IATF 16949:2016

Requirements and Guidelines for Developing a Control Plan

- Format
- Special characteristics
- Transfer or pass-through characteristics (PTC)
- Error-proofing
- Control Plan family
- Interdependent processes
- Repair and rework processes
- Reaction plan
- 100% visual inspection
- Black box processes
- Non design-responsible organizations
- Directed suppliers
- Use of software to develop the Control Plan

Development of the Control Plan

- Types of Control Plans
- Identification of the Control Plan
- Part identification (number / description)
- Supplier identification (plant / code / contact)
- Approvals
- Process identification
- Operation identification
- Machine / device identification
- Product characteristics
- Process characteristics
- Special / critical characteristics
- Product / process specifications
- Technique / evaluation method
- Sample size / frequency
- Control method
- Reaction plan

Effective Use of Control Plans

- Reverse FMEA
- Use of software
- Layered Process Audit
- Abnormalities in Control Plan management

Control Plan Development Workshop

MATERIAL DATA SYSTEM



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IMDS V.15.4

BEGINNER LEVEL

Objective:

The participant will be able to create, review, and approve Material Data Sheets (MDS) through the effective use of the IMDS platform, managing creation, submission, and version control, and using its main functions. They will also understand the importance of complying with current international regulations regarding the use of prohibited substances.

Prerequisites:

- Laptop per participant with internet connection
- IMDS user ID and login credentials

Duration:

16 hours

IMDS Introduction

- Changes in IMDS v.15.4
- Terms and definitions
- Importance of the IMDS platform
- Relation of IMDS with PPAP
- GADSL – Global Automotive Declarable Substance List

Data Tree Structure

- Definition of symbol
- Rules and guidelines
- Homogeneous materials
- Supply chain approach

Creating an MDS (Material Data Sheet)

- Searching for an MDS
- Own MDS / accepted / published
- Creating a material MDS
- Creating a semi-component MDS
- Creating a component MDS
- Creating an assembly MDS
- Confidential substances
- Origin symbols
- MDS verification
- Filters
- Acceptance / rejection criteria
- Application declaration
- Recycle declaration
- Plastic parts marking
- Errors and alerts
- MDS analysis

MDS Management

- Copy to new MDS
- New version
- Send / Propose / Internally publish / Publish
- Accepting / Rejecting an MDS
- Inbox / Outbox
- Status review
- MDS correction
- MDS report

User Administration

- Create users
- Personal settings
- Password change



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CQI-8 LAYERED PROCESS AUDITS

2ND VERSION, JANUARY 2014

Objective:

At the end of the course, the participant will understand the principles of Layered Process Audits (LPA) according to CQI-8 and will be able to plan audits, generate reports, and review findings. They will also understand the importance of audits as part of the continuous improvement process and compliance with customer-specific requirements.

Prerequisites:

- Basic understanding of processes (desirable)
- Risk-based thinking (desirable)
- Internal auditor knowledge of IATF 16949:2016 (desirable)
- Work experience in their organization

Duration:

8 hours

Introduction

- What is Layered Process Audit (LPA)?
- Definition of LPAs and their purpose
- Benefits of Layered Process Audits

Layered Process Audit Planning

- Audit objectives
- Audit process owner
- Development team
- Process knowledge
- Audit scope
- Customer-specific requirements
- Audit prioritization
- Number of audit layers
- Development of audit forms
- Audit frequency
- Layered audit process
- Reaction plan
- Top management involvement

Implementation of Layered Process Audits

- Definition of implementation team
- Auditor training
- Deployment in production areas

Audit Execution

- Conducting the audit
- Recording findings
- Verification of corrective actions

Top Management Review

Continuous Improvement of LPAs



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CQI-14

AUTOMOTIVE WARRANTY MANAGEMENT GUIDELINE, 4TH VERSION, APRIL 2022

Objective:
Provide best practices for warranty management, always focused on the customer.

Prerequisites:
- Process approach (desirable)
- IATF 16949:2016 internal auditor (desirable)
- Work experience in their organization in warranty-related processes

Duration:
16 hours

Introduction
- Introduction to warranties
- Establishing the baseline
- Establishing ownership
- Defining warranty strategies, behaviors and practices
- Establishing root cause methodologies

Consumer and Dealer Events and Activities
- Consumer focus
- Diagnostic information
- Dealer activities
- Testing

Prevention
- Lessons learned
- Use of FMEA in lessons learned
- Software change management
- Engaging the supply chain to reduce warranty risks

Implementation
- Tools through APQP
- Form completion

Containing Warranty Issues
- Warranty systems
- Investigations

Preventing Future Warranty Claims
- Establishing agreements with stakeholders
- Actions and solutions
- Identifying root cause after No Trouble Found (NTF) issues
- Continuous improvement



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CQI-19 SUPPLIER MANAGEMENT PROCESS GUIDE

1ST EDITION, AUGUST 2012

Objective:

Understand the requirements of this voluntary guideline to ensure supply chain readiness. Learn best practices for supplier management.

Prerequisites:

- Basic knowledge of the product process and/or manufacturing processes
- Awareness of the current supplier management system in their organization

Duration:

16 hours

Pre-selection Phase

- Fundamentals of an effective relationship
- Win-win philosophy
- Supplier search sources
- Supplier selection criteria
- Negotiation (physical and psychological preparation)
- Basic documentation for supplier registration
- Supplier registration form
- General contract clauses

Selection Phase

- Performance indicators (KPIs)
- Corrective action requests
- Technical capacity review

Introduction to Gap Analysis Tool

Self-assessment checklist completion practice

IATF 16949 Supplier Requirements

APQP Supplier Requirements

PPAP Supplier Requirements

Core Tools Overview from Supplier Development Perspective

Supplier Best Practices and Requirements

- ISO 9001 - IATF 16949
- Layered Process Audits
- Lean Manufacturing
- Waste (muda)
- Six Sigma
- Supply Chain Management



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CQI-27 CASTING SYSTEM ASSESSMENT

2ND EDITION, MARCH 2018

Objective:

Analyze casting processes to promote continuous improvement in the manufacturing of automotive components, with a preventive approach and complementary to product and customer requirements, in order to measure the organization's capability to comply with internal and external requirements.

Prerequisites:

- Quality systems (desirable)
- Risk-based thinking (desirable)
- IATF 16949:2016 internal auditor (desirable)
- Work experience in casting-related processes within your organization

Duration:

16 hours

Introduction

- What is CQI-27?
- Definition of CQI-27 and its purpose
- Benefits of its application

Planning

- Introduction to the process
- Qualities of the evaluator
- Evaluation of casting systems
- Requirements and guidance for the evaluation process

Implementation

- Identify the purpose of each objective
- Purpose clarification using numerical references

Strategy

- Casting system evaluation process
- Objectives of the casting system (molding system) process
- Requirements for applying CSA ("Casting System Assessment")
- Execution of the casting system evaluation process
  - + Management responsibility & quality planning
  - + Material handling and shop floor responsibilities
  - + Job Audit

CQI-27 Casting System Assessment Process Tables

- Process Table A – Sand Castings
- Process Table B – Centrifugal Castings
- Process Table C – Centrifugal Liners
- Process Table D – Investment Castings (Iron/Steel)
- Process Table E – Aluminium Semi-Permanent Mold Cylinder Heads
- Process Table F – Aluminium Sand Castings
- Process Table G – Aluminium Metal Mold
- Process Table H – Aluminium High Pressure Die Cast
- Process Table I – Magnesium High Pressure Die Cast
- Process Table J – Zinc High Pressure Die Cast

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PROBLEM SOLVING





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8 DISCIPLINES

PROBLEM SOLVING METHODOLOGY

Objective:
The participant will master the 8 Disciplines methodology for effective problem solving, will design the best control strategy to prevent recurrence, and will understand the importance of documentation and standardization of solutions.

Prerequisites:
- Work experience within their organization

Duration:
16 hours

Introduction
- Definitions
- Problem-solving methods
- ISO 9001 / IATF 16949 requirements
- Behaviors and values
- Company values
- Executive leadership
- Problem owners
- Problem solvers
- Customers
- Suppliers
- Background of the 8D methodology
- Elements of an 8D report

8 Disciplines methodology

D0: Emergency Response
- Customer complaint
- Description of symptoms
- Emergency response action
  + Check Sheet (tool)
  + Stratification (tool)

D1: Establish work team
- Team champion
- Team leader
- Technical experts
- Members
- Responsibilities
- Conflict management

D2: Problem description
- Problem selection
- Problem description
- Lessons learned
  + Pareto chart (tool)
  + Is / Is not analysis (tool)

D3: Containment actions
- Containment actions
- Locations, quantities, and products
- Customer notification

D4: Root Cause Identification and Verification
- Root cause verification
  + Ishikawa diagram (tool)
  + 5 Whys (tool)

D5: Selection and Verification of Permanent Corrective Actions
- Selection of corrective actions
  + Decision matrix (tool)
- Solution verification
- Solution levels

D6: Implementation and Validation of Corrective Actions
- Measurement of results
- Required resources
- Responsibilities
  + Implementation plan (tool)

D7: Prevent Recurrence
- Share lessons learned
- Sources of preventive actions

D8: Recognize the team
- Customer response
- Recognition
- Individual contributions

Criteria for Opening and Closing an 8D Report

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MEASUREMENT SYSTEMS





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GD&T

GEOMETRIC, DIMENSIONING & TOLERANCING

Objective:

The participant will learn the symbols and basic rules used in GD&T, will correctly interpret engineering drawings, and will recognize the importance of communication between customers and suppliers through a standardized framework of geometric dimensioning and tolerancing.

Prerequisites

- Basic geometry concepts
- Basic level of drawing interpretation

Duration:

16 hours

I. Dimensioning and Tolerancing

- Introduction and definitions
- Basic tolerances
- Dimensional tolerances

II. Standards for Drawing Representation

III. Surface Finish, Fits and ISO Dimensional Tolerances

- Surface roughness
- Symbols and fits
- ISO tolerances for holes
- ISO tolerances for shafts

IV. Geometric Tolerances

- Feature Control Frame
- GD&T symbols
- Modifiers
- Maximum and Least Material Condition
- Datum reference systems (datums)

V. Geometric Tolerances of Form

- Straightness
- Flatness
- Circularity
- Cylindricity

Tolerances of Location

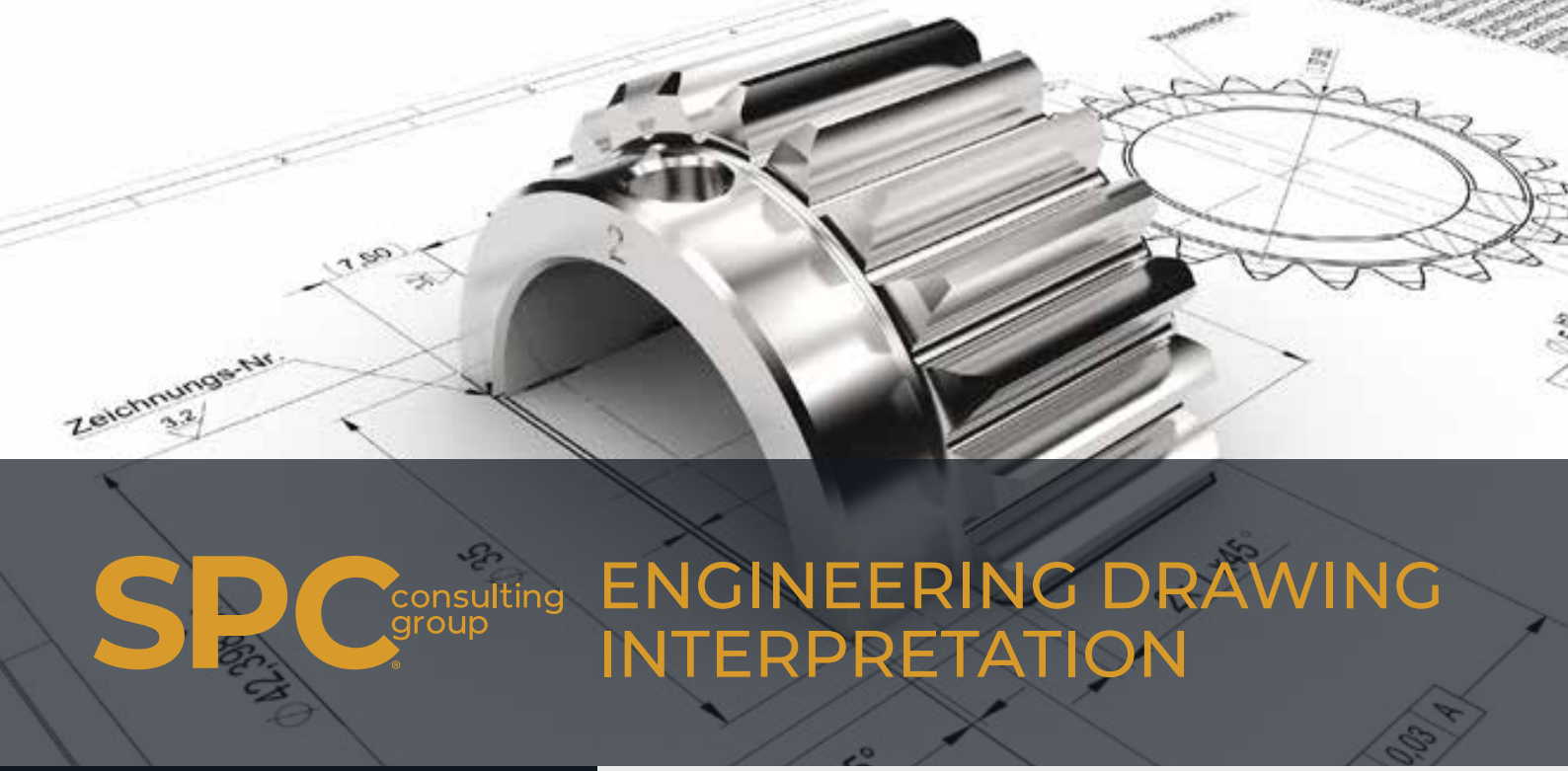
- Position
- Concentricity
- Symmetry
- MMC, RFC, LMC

Tolerances of Profile

- Profile of a line
- Profile of a surface

Tolerances of Runout

- Circular runout
- Total runout



SPC consulting group ENGINEERING DRAWING INTERPRETATION

Objective:

At the end of the course, the participant will be able to interpret engineering drawings and specifications in the manufacturing industry within the framework of IATF 16949:2016 or an equivalent quality management system.

Prerequisites:

- Basic knowledge of the process of product

Duration:

16 hours

Introduction

Engineering drawings reading

- Introduction
- Projection systems
- Rules on the representation of drawings
- Blueprints standard sizes
- Views and sections
- Scales

Metric and Imperial systems

- Introduction to tolerances
- Dimensional tolerances
- “Ballooning” and dimensioning in drawings

Surface Finishes

- Introduction
- Nomenclature
- Roughness values
- Roughness and processes

ISO Dimensional Fits and Tolerances

- Symbology and adjustments
- ISO Tolerances for Holes
- ISO Tolerances for Shafts

ANSI-ASME Y14.5 Standard for the Interpretation of Engineering Drawings

- Background
- Definitions
- Introduction to GD&T “Geometric Dimensioning and Tolerancing”



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METROLOGY FUNDAMENTALS

MEASUREMENT SYSTEMS

Objective:
At the end of the course the participant will be able to understand concepts and techniques used to evaluate the measurement systems and the fundamentals of metrology required in the environment of IATF 16949 or a quality management system equivalent.

Prerequisites:
- Knowledge of basic mathematics and MSA concepts

Duration:
16 hours

Introduction
- Quality Management System Requirements
- Background
- The measuring instrument and the environment

Terms
- Accuracy
- Precision
- Repeatability
- Reproducibility
- Bias
- Calibration
- Traceability
- Master gauge or calibrator
- Resolution
- Stability
- Bias
- Linearity

Measurement process
- The measurement process
- Characteristics of the measurements
- Types of Uncertainty
- Statistical properties
- Variation in the measurement process
- Complexity, scope and objective of the measurement
- Elements for the design and development of the measurement system

R&R studies
- R&R methodology
- R&R range method
- R&R mean and range method
- R&R ANOVA method
- R&R by attributes

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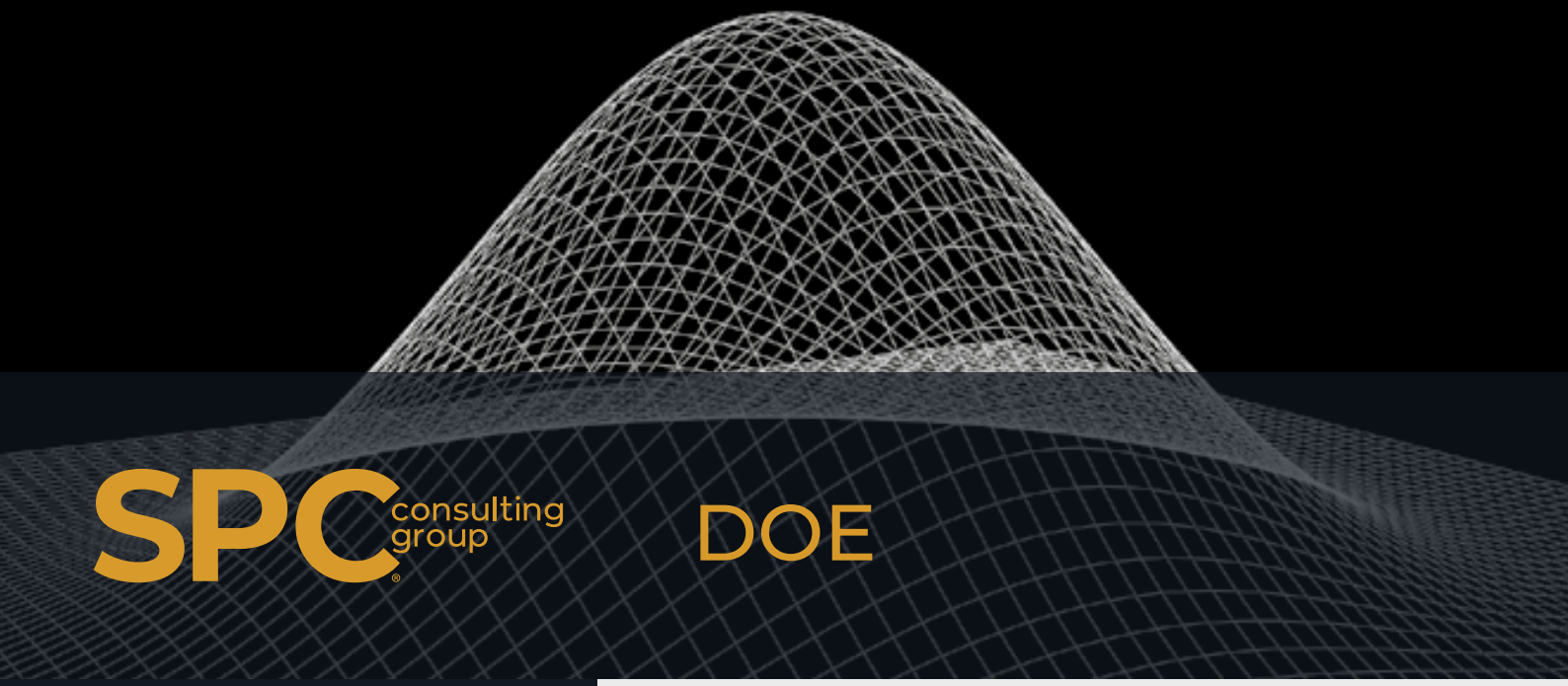
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STATISTICS





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DOE

Objective:

The participant will understand the theory for a factorial design to study the relationship between multiple input variables, or factors, on key output variables, or responses
The participants will use the software Minitab statistic for optimize the process output.

Prerequisites:

- Knowledge of the product process and/or manufacturing processes
- A computer with Minitab

Duration:

16 hours

Introduction

- Basic concepts
- Importance of experiments
- How do we plan an experiment?
- Descriptive statistics
- Hypothesis testing
- Analysis of variance of 1 and 2 factors
- Linear regression
- Types of Experimental Designs

Full Factorial Design

- Selection of factors and response variable
- Full factorial model
- 2-factors factorial design
- Balanced matrix
- Randomness
- Interactions
- Replication and repetitions
- Main effects and interactions
- Factors coding
- 3-factors factorial design

Minitab for Design of Experiments

- Creation of a factorial design
- Analysis of a factorial design
- Transfer function
- Factorial plots
  + Main effects plot
  + Interaction plot
  + Cube plot
- Response Optimizer

Fractional Factorial Design

- Fractional factors
- Selection of factors
- Aliasing
- Resolution

Results analysis

- From the mathematical model to the real world
- Decision making

6 Sigma Certification

Yellow Belt



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YELLOW BELT

SIX SIGMA BASICS

Objective:

The participant will become familiar with the basic statistic concepts and data analysis.
Also participants will understand the DMAIC methodology in order to identify and reduce the process variation and they will use the software Minitab statistic to optimize the process output.

Prerequisites:

- Basic knowledge of the process of product and/or manufacturing processes
- A computer with Minitab

Duration:

24 hours

Introduction

Define

- Basic concepts
- Descriptive statistics
- Analysis of variance of 1 and 2 factors
- Project charter

Measure

- Process Mapping
- Cause and Effect Analysis
- Measurement System Analysis
- PFMEA
- Process Capability Analysis
- Confirm the project baseline

Analyze

- Graphical analysis
- Confidence interval for a mean
- Hypothesis testing

Improve

- Intro to DOE
  + Full factorial model
  + 2-factors factorial design

Control

- X-R control chart
- Attribute control charts
- Mistake proofing



6 Sigma Certification

Green Belt

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GREEN BELT

SIX SIGMA

Objective:

The participant will develop continuous improvement projects based on six sigma to reduce a process variability.

Prerequisites:

- Basic experience in Project Management
- Product manufacturing knowledge, operational floor experience and product handling

Duration:

80 hours + 8 hours for project follow up

Definition

- Six Sigma definition
- Project definition
- Minitab intro
- Basic statistics

Measurement

- Process map
- Cause and effect
- Process statistics
- MSA (Measurement System Analysis)
- Capability analysis

Analysis

- Graphical methods
- Process FMEA
- Confidence intervals
- Testing hypothesis
- Analysis of means
- One way ANOVA

Improvement

- DOE introduction
- Full factorial testing
- Fractional factorial testing 2k

Control

- Introduction
- Control methods
- SPC intro
- SPC variable control charts
- Project closure



MINITAB REQUIRED

SPC consulting group

SIX SIGMA

ANALYSIS AND REDUCTION OF VARIATION

Objective:
The participant will identify the phases of the DMAIC methodology, as well as its scope and deliverables. They will also be able to detect the cases in which this methodology should be applied.

Prerequisites:
• Knowledge of the fundamentals of the ISO quality management system or its equivalent, as well as basic/intermediate statistics and planning and leadership skills

Duration:
16 hours

Introduction

Definition
- Definition of the Project
- Minitab Tutorial (Part 1)
- Introduction to Basic Statistics
- Introduction to ANOVA

Measurement
- Process Mapping
- Cause-and-Effect Tools (Ishikawa)
- Measurement System Analysis (MSA and R&R)
- Failure Mode and Effect Analysis (FMEA)
- Capability Analysis (Cp, Cpk)
- Project Planning and Deliverables

Analysis
- Process Capability Analysis (Cp, Cpk)
- Graphical Methods
- Central Limit Theorem
- Confidence Intervals
- Hypothesis Testing
- Mean and Variance Tests

Improvement
- Introduction to Design of Experiments (DOE)
- Full Factorial Design
- 2k Factorial Design
- Project Review

Control
- Quality Fundamentals
- X-R Control Charts
- Moving Range Control Charts
- Attribute Control Charts
- Mistake Proofing Practice Exercises I, II, III, IV, and V



MINITAB REQUIRED

SPC consulting group

MINITAB

PRACTICAL USE OF THE SOFTWARE

Objective:

At the end of the course, the participant will know the main commands of Minitab software and will recognize the importance of data-driven decision-making.

Prerequisites:

- Basic statistical concepts (mean, range, standard deviation, population, sample)
- At least 3 months of work experience in the organization

Duration:

16 hours

The following studies and analysis will be performed using the software commands:

Introduction to Minitab

- Minitab Menu
- Command, window, data, and file management
- Graphs and their interpretation:
  - + Pareto
  - + Histograms
  - + Boxplots
  - + Time Series

Basic Statistics

- Basic Statistics
  - + Mean
  - + Median
  - + Range
  - + Mode
- Basic Concepts
  - + Normality
  - + Standard Deviation

Basic Statistical Analysis

- Distribution Shape
- Descriptive Statistics
- Graphical Summary
- Normality Test
- Hypothesis Testing
  - + One-Sample t-Test
  - + Two-Sample t-Test
  - + Paired Two-Sample t-Test

Regression and Correlation Analysis

- Concepts of Regression and Correlation
- Scatter Diagram
- Simple and Multiple Correlation
- Pearson Coefficient
- Assumptions and Residual Analysis

MSA - Measurement System Analysis

- Terminology
- Stability
- Accuracy
- Linearity
- Gage R&R Study (crossed)
- Attribute Study

SPC - Statistical Process Control

- X-R Chart for Data Samples
- P Chart for Defective Parts

Quality Tools

- Process Capability Studies
- Normal Distribution - Cp, Cpk, Pp, Ppk

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313 654 9545
info@spc-us.com

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PRODUCTIVITY





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TIME & MOTION STUDY

IMPROVING PRODUCTIVITY

Objective:

The participant will develop the skill to evaluate and analyze processes to make the best improvement efforts. At the end of the course, the participant will know that improving productivity is often about reducing wasted movement and time.

Prerequisites:

- Basic knowledge of the product manufacturing process

Directed to:

- To all those people who are related to process management

Duration:

16 hours

Introduction

- Elemental time study
  - + Observating the operation
  - + Drawing the layout
  - + Group into basic motion elements
  - + Comparing the elements to the steps of the work instruction
- Time measurement
- Reading the stop watch

Time and Motion Terms and Definitions

- Real time
- Standard time
- The westinghouse rating system
- Allowances

Predetermined Motion Time Standards

- Toyota methodology for time study
- Standard methodologies
- MOST (Maynard Operation Sequence Technique)

Workshop



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LEAN MANUFACTURING

TPS

Objective:

At the end of the course the participant will be able to interpret, homologate and standardize the bases and criteria that support to the Lean Manufacturing concepts. The participant will be familiar with some support methodologies like Cellular Manufacturing, Kanban and One Piece Flow in order to minimize WIP and increase the profitability of the organization.

Prerequisites:

- Basic knowledge of the process of product

Duration:

16 hours

Introduction
- Lean thinking intro

Lean Manufacturing Overview
- Lean history
- Terms and definitions
- Operating model
  + Customer centricity
  + Continuous flow
  + Thinking systems
  + Simplicity
- Value Stream Mapping
- Kaizen events

Visual Management Systems & 5S
- Concept
- Techniques and methods
- Barriers for the implementation
- On-site evaluation

Takt Time and Line Balancing
- One Piece Flow
- Takt Time concept
- Line balancing methodology

Cellular Manufacturing and Standard Work
- The Manufacturing Cell concept
- Types of cells
- Application methodology
- Understanding standard work
- On-site evaluation

KANBAN / HEIJUNKA
- Concept
- Techniques and methods

TPM & SMED
- Concept
- Techniques and methods
- Barriers for the implementation

Poka Yoke
- Concept
- Techniques and methods

Problem Solving
- Concept
- Techniques and methods

Kamishibai
- Concept
- Techniques and methods

Implementing Lean Manufacturing



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TPM

TOTAL PRODUCTIVE MAINTENANCE

Objective:

The participants will be able to standardize criteria according to TPM concepts and best practices.
Also, the participants will be able to explain how education and training supports the goals of TPM.

Prerequisites:

- A general knowledge of the manufacturing and maintenance processes

Duration:

16 hours

TPM Introduction

- JIPM (Japanese Institute of Plant Maintenance) concepts, bases and terminology

Lean manufacturing

- History
- Model
  + Correctly specify value for the customer
  + Identify the value stream and remove waste
  + Make the product flow, so the customer can pull
  + By striving towards perfection, simplicity
  + Kaizen

TPM

- History
- 8 pillars model
  + Education and training
  + Autonomous maintenance
  + Planned maintenance (TBM, CBM, inspection)
  + Focused improvement
  + Early/equipment management (RCM)
  + Quality management
  + Safety health environmental conditions
  + Administrative & office TPM

Understanding TPM KPI's

- OEE
- MTBF
- MTTR

TPM 12 step approach

- Preparation
  + Step 1 Declaration by management
  + Step 2 Introductory education and campaign
  + Step 3 TPM organization and pilot activity
  + Step 4 Setting basic policy and target
  + Step 5 Master plan for implementation
- Kick off
  + Step 6 Kick off
- Implementation
  + Step 7 Improving production efficiency
  + Step 8 Autonomous maintenance
  + Step 9 Planned maintenance
  + Step 10 Education and training
  + Step 11 Develop TPM program
- Steady application
  + Step 12 Total application of TPM

TPM support

- Problem solving
- Visual management
- Standardization
- Kamishibai



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PROJECT MANAGEMENT

Objective:

Study the topics and the proper sequence for conducting, planning and project management, considering the most important points of traceability and execution to accomplish the expected results through a practical and effective methodology.

Prerequisites:

- Knowledge on quality systems and process mapping development

Duration:

24 hours

Introduction

1. Define Project Opportunities

- Business Case
- Opportunity for improvement
- Scope and limitations
- Final goals and variables
- Team creation
- Change Management
- Communication plan and activities

2. Current Process Initial Map

- Suppliers, inputs, outputs, customer
- Identifying initial activities
- Main activities and critical path
- Ideal state and the current state variations
- The work breakdown structure (WBS Work Breakdown Structure)

3. Monitoring Plan Development

- Key indicators (quality testing)
- Operational indicators description
- Measuring and monitoring plan
- Roles and responsibilities
- Contingency plan
- Supplier development

4. Project Performance Analysis

- Formats
- Performance reports
- Costing and investments
- Containment plans
- Root cause
- Risk analysis
- Final solutions validation

5. Activities Implementation

- Critical path selection
- Main activities
- Times & stages review
- Results monitoring
- Implementation
- Delivery of supplies and resources
- Project documentation

6. Control Phase Preparation Team

- Review initial objectives
- Similar projects alternatives
- Final results confirmation
- Ideal state map
- Performance objectives
- Final tests
- Final customer feedback

7. Project Delivery

- Final stages acceptance
- Final project documentation
- Delivery format
- Continuous Improvement cycle
- Lessons learned documentation
- Project approval ending

8. Tools for Project Management

- MS Project Management
- Task management
- Design viewers

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info@spc-us.com

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SUPPLY CHAIN





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SUPPLY CHAIN MANAGEMENT

Objective:

The participants will be able to recognize the key strategic factors to improve their supply chain management.
Also, they will be able to standardize criteria, guidelines and mandatory practices to align resources of all the organization.

Prerequisites:

• A general knowledge of the basics of the Quality Management System used in the organization is recommended but also have had contact with the environment in the organization's supply chain, inventories and logistics issues.

Duration:

8 hours

Content

Supply Chain – General concepts

- The fundamentals of end-to-end Supply Chain Management
- Product, services, and information flow
- Supply Chain processes
- Global Supply Chains: End to end sourcing
- Process Integration in real-time needed on Supply Chains

Forrester effect (Bullwhip) on Supply Chains

- Reliable information for decision making
- Inventories roles on Supply Chain
- Beer game
- Supply Chain best practices

On-site Logistics

- On-site storage and warehousing – inbound and outbound
- Materials management
- INCOTERMS

Legal aspects

- Purchasing transactions – terms and conditions
- Legal aspects of contracts

The role of the supply chain analyst

- Supply Chain responsible functions and profile
- Customer service and operational excellence
- Collaboration as a tool to create and maintain chains of world-class supply



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spc-us.com

313 654 9545
info@spc-us.com

Anillo Periférico 301, Piso 2, Col. San Jemo,
Monterrey, Nuevo León CP 64630