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Automotive Core Tools Courses and Workshops

"Automotive Core Tools" is a general title used to describe several tools and methodologies developed, published and required by most automotive OEMs. Implementation and usage of these core tools is required by ISO/TS 16949:2009. Except for PPAP, the associated manuals used in the implementation of these core tools are considered to be "reference" manuals. Although they shall be used by the organization implementing them, they are considered guidance. Organizations have some flexibility in how they use them. This flexibility is discussed in detail during all courses and workshops. The core tools are:

- Advanced Product Quality Planning, (APQP)
- Failure Mode and Effects Analysis (FMEA)
- Statistical Process Control (SPC)
- Measurement Systems Analysis (MSA)
- Production Part Approval Process (PPAP)

Although it is recommended, organizations do not have to be compliant to ISO/TS 16949:2009 to use these core tools. Some OEMs and Tier One suppliers require their suppliers to implement, and use, the core tools regardless of their status of compliance to ISO/TS 16949:2009. Many sectors outside the automotive industry are using these core tools as they realize the benefits of implementation.

All Core Tool workshops, and courses, can be conducted individually or in conjunction with one another. Courses can range from a short 4 hour overview up to a multi day development workshop that may include one, or all, of the core tools. *The duration of courses and workshops is dependent on the needs of your organization and the participants involved*. It is recommended that we discuss your current status with the core tools, and the needs of your organization prior to deciding on course duration and intent.

For Internal Auditors:
ISO/TS 16949:2009 requires that all Internal Auditors have fundamental training in the effective evaluation of all core tools. All courses listed here contain the outcomes that meet those requirements. *If these courses will be for purposes of training Internal Auditors only, all courses listed below can be reformatted into a "Core Tools Workshop" and course duration times can be reduced by as much as 50%.*

APQP Overview

This one day course is intended for those who need a general understanding of the requirements of APQP as they relate to ISO/TS 16949:2009. Participants will review and discuss the implementation techniques, recommended approaches, and the benefits of an effective APQP system. Although this course is not intended to provide a detailed discussion on the remaining core tools, participants will receive a fundamental review of each core tool and its intent.

Coursework covers:

- Review of the requirements of APQP and Control Plans as they relate to ISO/TS 16949:2009
- A detailed review of the APQP reference manual
- Discussion on the 5 phases of APQP
- Review of recommended practices for implementation and sharing of best practices of APQP and Control Plans
- A fundamental discussion on the requirements of the remaining core tools. (FMEA, SPC, MSA, PPAP)

Course Outcomes:

- Supply participants with a understanding of APQP and Control Plans as they relate to ISO/TS 16949:2009
- Be able to explain the format and contents of the APQP reference manual including the 5 phases
- Understand and explain recommended formats for an effective APQP and Control Plan systems
- Have a fundamental understanding of the requirements of the remaining core tools

Course duration:

- 8 hours

Materials Provided:

- Copy of the presentation materials

Note: Published copies of the Advanced Product Quality Planning reference manual are recommended and can be provided for each participant at AIAG member prices. www.aiag.org

APQP How To Workshop

This workshop is intended for those participants who need a detailed understanding of APQP, Control Plans, and the PPAP process. The workshop focuses on the details of the implementation and execution of the APQP process for a new product or major changes to an existing product. The workshop is designed to use an existing product currently supplied to a customer as a case study. During the course participants will use this existing product, and the associated documentation, (FMEAs, PPAPs, etc.) for activities and discussion. A detailed review of the PPAP process, and manual, will also be conducted.

Coursework covers:

- All the course work covered in "APQP Overview"
- A detailed review of implementation formats and techniques
- Activities and a detailed review of each of the remaining core tools
- Development activities based around effective Control Plan development
- Discussion of the importance and benefits of proper identification of special product and process characteristics
- Activities based around the proper linkage of these special product and process characteristics within the APQP document system
- A detailed review of the PPAP manual, and the resulting process
- Review and discussion of customer specific requirements for APQP

Course Outcomes:

- Understand the fundamental requirements of APQP and all remaining Core Tools
- Be able to lead the organization in the proper conduct of the APQP process
- Be able to develop, and explain, effective Control Plans
- Know how to identify, and explain the importance of, special product and process characteristics
- Understand the importance of the proper linkage of APQP documentation
- Be able to conduct, and prepare, a PPAP package for submission to the customer
- Explain the importance of the identification of customer specific requirements during the APQP process

Course duration:

- 16-24 hours

Materials Provided:

- Copy of the presentation materials
- Copies of both the APQP reference manual and PPAP requirements manuals

Note: Published copies of the Advanced Product Quality Planning reference manual and PPAP are provided for each participant at AIAG member prices. www.aiag.org

PPAP Overview

This 4 hour course is intended for those who need a general understanding of the requirements of PPAP as they relate to ISO/TS 16949:2009. Participants will receive a detailed review of the PPAP manual and discuss the proper conduct of the PPAP process. Discussion will also take place on the proper format of the PPAP package, for both electronic, and hard copy submission to the customer. Customer specific requirements for PPAP will also be discussed. Although all the remaining core tools will be discussed, this course is not intended to give participants a detailed understanding of those core tools.

Coursework covers:

- Review of the fundamental requirements of PPAP
- A detailed review of the PPAP requirements manual
- Discussion on the proper conduct of the PPAP process
- Review of best practices for organizing, and submitting a PPAP package to the customer
- Discuss customer specific requirements for the PPAP process

Course Outcomes:

- Understand the fundamental requirements of PPAP
- Be able to explain the PPAP manual format to others
- Explain the PPAP process, and package format to others
- Know how to attain customer specific requirements for PPAP

Course duration:

- 4 hours

Materials Provided:

- Copy of the presentation materials

Note: Published copies of the Production Part Approval Process (PPAP) manual are recommended and can be provided for each participant at AIAG member prices. www.aiag.org

FMEA Workshop

This workshop is intended for those participants who need a detailed understanding of the Potential Failure Mode and Effects Analysis (FMEA) process. The workshop focuses on both DFMEA and PFMEA. Recommended participants should be both Product and Process Designers and Engineers. Others within the organization who will support the process, such as Quality and Management personnel, are encouraged to attend.

The workshop focuses on how FMEAs should be used during product and process development to identify function, potential failure of that function, effect of that failure on the customer(s), current controls in place to prevent that failure, and prioritization of recommended actions during the development/prototype process. Existing FMEAs on current products and processes are recommended for use during the workshop as case studies.

Coursework covers:

- A detailed review of the requirement of DFMEA and PFMEA as it relates to ISO/TS 16949:2009
- A detailed review of the FMEA manual
- Activities and discussion to reinforce that FMEA is the fundamental cornerstone of all product and process development activity
- Activities and discussion on the proper development of FMEAs early in the process
- The use of existing failure mode data on current products and processes for the development of new FMEAs
- Discussion on different FMEA formats that can be used
- A review of customer specific requirements for FMEA

Course Outcomes:

- Understand the fundamental requirements of FMEA as they relate to ISO/TS 16949:2009
- Be able to explain to other the importance of early FMEA development
- Know how to develop, and use, FMEAs for proper identification and control of potential failure modes in both products and processes.
- Understand the different formats that can be used in FMEA development and how they can benefit your organization
- Understand any customer specific requirements for FMEA

Course duration:

- 8-16 hours

Materials Provided:

- Copy of the presentation materials
- Copies of the FMEA reference manual

Note: This course can be customized depending on your organizations design responsibility for DFMEA, PFMEA, or both.

Published copies of the FMEA reference manual are provided for each participant at AIAG member prices. www.aiag.org

Statistical Process Control (SPC)

This 8 hour course is intended for those who need a detailed understanding of the implementation and usage of SPC in the manufacturing process. Recommended participants should be Quality personnel or others that may be responsible for the identification and implementation of product and process control. Through discussion and activities participants will learn the fundamentals of the planning, collection, and analysis of product and process data using variable control charts (Xbar&R) and process capability (Cpk/Ppk) calculations. The course content is based on the SPC reference manual published by AIAG for the automotive industry.

Coursework covers:

- Review of the fundamental requirements of SPC as they relate to automotive production part manufacturing
- Learn how SPC for data collection is identified on the control plan
- Learn how to construct, and use, histograms and Xbar&R charts
- Learn how to calculate, and when to use, Cpk and Ppk data
- Review the fundamentals of attribute control charts
- Discuss customer specific requirements for SPC and the PPAP process

Course Outcomes:

- Understand the fundamental of SPC as they relate to the automotive industry
- Explain how the control plan is used to identify SPC
- Understand and explain how to develop and use Xbar&R charts
- Be able to explain Cpk/Ppk to others and perform the basic calculations
- Know the fundamental usage of attribute control charts
- Be able to identify customer specific requirement for SPC

Course duration:

- 8 hours

Materials Provided:

- Copy of the presentation materials

Note: Published copies of the Statistical Process Control reference manual are recommended and can be provided for each participant at AIAG member prices. www.aiag.org

Measurement Systems Analysis (MSA/GRR)

This 8 hour course is intended for those who need a detailed understanding of the implementation and usage of MSA/GRR in the automotive industry. Recommended participants should be Quality personnel or others that may be responsible for the identification, implementation, and proper conduct of MSA/GRR. Through discussion and activities participants will learn the fundamentals of MSA/GRR in both average, (short) and average range, (long) methods. Other analytical methods for attribute gauges and ANOVA will be discussed. The course content is based on the MSA reference manual published by AIAG for the automotive industry.
It is highly recommended that current parts produced by the organization, and their related gauges, be used for case studies and activities during the course.

Coursework covers:

- Review of the fundamental requirements of MSA as they relate to automotive production part manufacturing
- Be able to explain the benefits of understanding variation in the measurement system
- Learn how MSA requirements are identified during the APQP process
- Learn how to conduct both the average, and average and range, method for variable data
- Discuss the techniques for MSA using attribute data
- Review other customer specific requirements such as ANOVA

Course Outcomes:

- Understand the fundamental of MSA as they relate to the automotive industry
- Know, and explain to other, the benefits of MSA
- Be able to identify MSA requirements during the APQP process
- Be able to conduct both the short and long methods of MSA/GRR
- Understand the fundamentals of attribute MSA/GRR studies and customer specific requirements

Course duration:

- 8 hours

Materials Provided:

- Copy of the presentation materials

Note: Published copies of the Measurement Systems Analysis reference manual are recommended and can be provided for each participant at AIAG member prices. www.aiag.org