



TRAINING SYLLABUS

AS13006 Process Control Methods Training Syllabus

Appendix C

Revised

2018-Aug-28

This section provides a training syllabus to support competence in the application of this standard. This syllabus may be adapted to meet any additional needs (e.g., advanced control charting techniques).

Some of these necessary competencies may be achieved through traditional quality and improvement training such as Six Sigma accreditation programs (e.g., Green Belt, Black Belt, and Master Black Belt) or professional institution recognized accreditation (e.g., ASQ Certified Quality Engineer).

It should be noted that competency is only truly achieved and maintained through practical application.

1. TARGET AUDIENCE

This training is intended for aerospace practitioners who work in job roles related to manufacturing process design, quality planning and product introduction, quality control and quality improvement, etc.

2. PRE-REQUISITES

Learners should be proficient in basic arithmetic and statistics, have a good knowledge of quality management systems and customer requirements for the application of process control.

3. TRAINING KEY FOCUS AREAS

The following themes reflect the process control activities within this standard:

- 3.1 The importance of Process Control
- 3.2 Process Control in context of quality planning
- 3.3 Selection of Process Control Methods
- 3.4 Data Collection
- 3.5 Process Capability Analysis
- 3.6 Basic Root Cause Analysis and Process Improvement
- 3.7 Application of Control Charts
- 3.8 Error-Proofing
- 3.9 Other relevant techniques (optional)

4. TRAINING DETAIL

Table 1 provides details of the various themes and content to be covered in the training.

Table 1 – Training Syllabus

THEME	OUTCOMES	MINIMUM CONTENT
The importance of Process Control	<p>Appreciation of customers' needs and the benefits to the organization, industry and society</p> <p>Learning Objective: Learner will be able to describe the importance of process control including how it benefits company, industry, and society.</p>	<ul style="list-style-type: none"> • Examples and discussion on process control failures • Reputational impact • Effect on the Aerospace industry • Benefits of achieving design nominal (Taguchi's Loss Function) • Understanding and importance of a closed loop control system • Effectiveness of in process control over end-of-line inspection
Process Control in Context of Quality Planning	<p>Understanding of the linkages between the quality planning activities</p> <p>Learning Objective: Learner will be able to explain the purpose of Control Plans, what they contain, and their use in developing work instructions.</p> <p>Learning Objective: Learner will be able to describe how Control Plans link to Process FMEA.</p>	<ul style="list-style-type: none"> • Linkage between PFMEA, Control Plans, and work instructions • Purpose and content of a Control Plan
Selection of Process Control Methods	<p>Ability to select the most appropriate control(s)</p> <p>Learning Objective: Learner will be able to analyze a situation and select the most appropriate process control method(s).</p>	<ul style="list-style-type: none"> • Basic overview and explanation of the various control methods
Data Collection	<p>Ability to collect data that is appropriate and reliable</p> <p>Learning Objective: Learner will be able to identify the important components of reliable data collection and how to develop a data collection plan.</p>	<ul style="list-style-type: none"> • Importance of time sequence • Importance of reliable measurement systems • Importance of non-biased data and operational definition for data collection • Sample size considerations

Table 1 – Training Syllabus (continued)

THEME	OUTCOMES	MINIMUM CONTENT
Process Capability Analysis	<p>Ability to select and correctly apply the appropriate analysis tool and draw correct conclusions</p> <p>Learning Objective: Learner will be able to evaluate a situation, select the appropriate analysis tool for that situation, and correctly apply that tool.</p>	<ul style="list-style-type: none"> • Basic statistical terms (Mean, Standard Deviation, Range) • Process Stability assessment using control charts • Special Cause vs Common Cause Variation • Tests for Special Causes Variation • Process Capability assessment (Cp, Cpk, Pp, Ppk) • Incorrect assumption that a high Cpk is on-target. • Process Capability prerequisites (e.g., Stability, Normality check) • Handling non-normal data (Distribution identification or data transformation) • Relevant statistical software
Basic Root Cause Analysis and Process Improvement	<p>Ability to understand potential improvement options and appropriately confirm their effectiveness</p> <p>Learning Objective: Learner will be able to distinguish special causes of variation from common cause variation</p> <p>Learning Objective: Learner will be able to explain the available options for confirming change effectiveness</p>	<ul style="list-style-type: none"> • Appropriate reaction to special causes of variation vs common cause variation. • Options for confirmation of change effectiveness. (e.g., Process Control & Capability Analysis including before vs. after comparison)
Application of Control Charts	<p>Ability to use control charts for process analysis and in-operation process control</p> <p>Learning Objective: Learner will be able to identify the appropriate control chart tool from a list of tools based on a definition provided.</p> <p>Learning Objective: Learner will be able to apply control charts for process analysis and in-operation process control using the appropriate control chart.</p>	<p>Use of the following tools:</p> <p>I-MR Chart</p> <p>Rational Subgrouping</p> <p>X-Bar/ & R Chart – including assumptions.</p> <p>I-MR-R/S – Between/Within (3 Way Chart)</p> <p>Attribute charts (P, C, NP, U) including subgroup sizes and assumptions</p> <p>Charts for Rare Events</p> <p>Short run principles (e.g., deviation to target charts)</p> <ul style="list-style-type: none"> • PreControl Charts

Table 1 – Training Syllabus (continued)

THEME	OUTCOMES	MINIMUM CONTENT
Error Proofing	Ability to understand and apply error proofing to the process Learning Objective: Learner will be able to explain and/or give examples of error proofing including principles, levels, and automated control systems.	<ul style="list-style-type: none"> • Error proofing principles, devices and strategies • Levels of error proofing • Examples of error proofing application • Automated Control systems
Other relevant techniques (optional)	Awareness of other techniques as needed	<ul style="list-style-type: none"> • Design of Experiments • Hypothesis testing • Measurement Systems Analysis (including awareness of AS13003)

5. ASSESSMENT OF LEARNING

Training should include a valid method of assessing learner's mastery of each learning objective. Recommended assessment methods include:

- An exam that uses multiple choice, fill-in-the-blank, or matching type questions with a formal pass criteria (e.g., 70%)
- Completion of practical exercises within the structure of the course
- Competency judged on evidence of workplace application (e.g., workplace project)