

Update to the AIAG- SPC Reference Manual

Michael Down

General Motors Corporation/SPC Rewrite Chairman

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SPC Rewrite Committee

ABSTRACT

The SPC reference manual was one of the first manuals released by Ford, GM, and DaimlerChrysler (formally Chrysler) to communicate the methods and application of Statistical Process Control. It has been useful, but it was released in the early 80's and required updating in relation to style, changes in philosophy, and the introduction of new methods.

INTRODUCTION

SPC- Statistical Process Control has been around for many years, first created by Walter Shewhart in the 1920. It came to the forefront by Dr. W. Edwards Deming's teaching and application in Japan in the mid 40's after World War Two and into the early 80's when it became recognized in the US. It eventually became a requirement of all US automotive suppliers to have proof of the application of SPC and that the parts being delivered were from a stable process.

MAIN SECTION

The main purpose of this paper is to review the philosophy used in the development of the new SPC reference manual, the changes and additional methods reviewed and supported.

PHILOSOPHY OF THE SUBCOMMITTEE

Prior to starting the rewrite the committee established specific norms to follow while developing the manual. They were as follows:

- Update the format to match current manuals
- Evaluate order, improve logic
- Customer focused: Easier to use and understand
- Reduce focus on indices
- Up-front reinforce the need for a system of application and analysis
- Add additional methods that have been introduced since the manual was published
- Improve the glossary and index
- Review and update reference list

Introduction

The manual contains information from the basics of SPC, management support process, the common statistical methods, and additional methods that can be used in special situations. The introduction sets the stage by showing the importance of using SPC to define variation.

- Establish where the process is centered
- Whether the process is stable or unstable
- The amount of variation that exists.

Data, Results, and Measurement

Decisions and estimates are based on a perception of what the population is doing. The quality of this perception is based on a number of issues.

- Homogeneous population
- Distribution of the population
- Sampling plan
- Whether the process and population are stable
- Measurement variation
- Interdependent variables

The stability and uniformity of the population is critical to understand prior to collecting and analyzing data. The uniformity and stability of the population impact the way that collect the data and the way the data is analyzed. This is not just a "point of view", it always exist whether it taken into account or ignored. In most cases a normal distribution (bell curve) in relation to a continuous process.

Sampling can also impact the results of data collection and analysis. In some cases a randomized sample is required. This means by where, when and how the sample is taken from the population. Randomization helps to limit bias and also gives a better picture of what the variation in the population looks like. In other cases, the sample isn't random; parts are either specifically selected or made to specific requirements. This often occurs in engineering development or when problem solving issues. (Note: Distribution, Uniformity, and stability of the population are assumed/ Measurement variation is small)

Aiag Spc Referance Manual

T.M. Kubiak



Aiag Spc Referance Manual:

Statistical Process Control , *The Certified Six Sigma Master Black Belt Handbook* T.M. Kubiak,2012-11-19

Organizations are continuously trying to improve by reducing cost increasing customer satisfaction and creating an environment of empowered employees who continuously strive for excellence in each process and product In much the same way governments are continuously required to do more with less enhance budget and organizational performance and identify innovative ways to increase their impact There are challenges to applying the Lean Six Sigma LSS tools in the public sector Examples of these challenges include hierarchical environments a lack of common goals and the complexity of working in the public sector The information included as part of this book provides over 30 spotlights highlighting project examples lessons learned and tips and tricks for using LSS in the public sector These spotlights are based on interviews facilitated with a robust sampling of senior operations strategy practitioners The LSS methodology focuses on eliminating waste lean and then reducing variation Six Sigma in a process or product that contains no waste The information covered in this book will allow someone to have an immediate impact in any public sector organization It describes some of the most powerful continuous process improvement tools that can be used with limited training required This is further enhanced by showing direct correlations to the LSS tools and the challenges that will be faced Because the public sector spans such a diverse range of organizational charters such as transportation education and defense this book does not focus solely on either manufacturing or services Rather it provides a balanced approach to utilizing LSS in all environments

Advanced Product Quality Planning D. H. Stamatis,2018-11-12 This book defines develops and examines the foundations of the APQP Advanced Product Quality Planning methodology It explains in detail the five phases and it relates its significance to national international and customer specific standards It also includes additional information on the PPAP Production Part Approval Process Risk Warranty GD T Geometric Dimensioning and Tolerancing and the role of leadership as they apply to the continual improvement process of any organization Features Defines and explains the five stages of APQP in detail Identifies and zeroes in on the critical steps of the APQP methodology Covers the issue of risk as it is defined in the ISO 9001 IATF 16949 the pending VDA and the OEM requirements Presents the role of leadership and management in the APQP methodology Summarizes all of the change requirements of the IATF standard

Sustaining a Culture of Process Control and Continuous Improvement Philip J. Gisi,2018-05-16 This comprehensive book presents a methodology for continuous process improvement in a structured logical and easily understandable framework based on industry accepted tools techniques and practices It begins by explaining the conditions necessary for establishing a stable and capable process and the actions required to maintain process control while setting the stage for sustainable efficiency improvements driven by waste elimination and process flow enhancement This structured approach makes a clear connection between the need for a quality process to serve as the foundation for incremental efficiency improvements This book moves beyond talking about

the value contribution of tools and techniques for process control and continuous improvement by focusing on the daily work routines necessary to maintain and sustain these activities as part of a lean process and management mindset Part 1 discusses process quality improvement with an understanding of variation and its impact on process performance It continues by stressing the importance of standardizing a process to achieve process stability Once process stability is reflected in a consistent and predictable output attention is turned to ensuring the process is capable of consistently meeting customer requirements This series of activities sets the foundation for process control and the sustainable pursuit of efficiency improvements Part 2 focuses on efficiency improvement by eliminating waste while improving process flow using proven tools and methods Although there is a clear relationship between waste elimination and process flow these activities are discussed separately to allow those more interested in waste elimination to work independently from those looking to optimize value stream flow Part 3 explores the principles practices systems and behaviors required to maintain process control while creating a mindset of continuous incremental improvement It considers the role organizational structure discipline and accountability play as essential components for long term operational success This book will Provide readers with a clear roadmap for establishing achieving and maintaining process control as the foundation upon which to pursue efficiency improvements Establish direction and methods for continuous and sustainable process improvement Define the practices systems and behaviors required to realize desired results and develop a culture of process control and continuous improvement along the road to operational excellence

Leading High-Reliability Organizations in Healthcare Richard Morrow, 2016-03-15 This book details the attributes and practices that help high reliability organizations HROs excel in the service they provide to their customers Explaining what it takes to achieve high reliability in healthcare settings it presents proven tools and concepts that leading healthcare organizations are using to improve safety and quality The book identifies the necessary infrastructure methods and analytics required to achieve and sustain higher reliability It also includes case studies that illustrate success stories and failures so readers can avoid making the same mistakes

Implementing Six Sigma Forrest W. Breyfogle, III, 2003-11-10 Das bew hrte Handbuch zum Statistiktool Six Sigma jetzt in neuer aktualisierter Auflage besprochen werden t glich ben tigte Verfahren und deren Implementation erweiterte Behandlung u a des

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Supply Chain Engineering and Logistics Handbook Erick C. Jones, 2019-11-12 This handbook begins with the history of Supply Chain SC Engineering it goes on to explain how the SC is connected today and rounds out with future trends The overall merit of the book is that it introduces a framework similar to sundial that allows an organization to determine where their company may fall on the SC Technology Scale The book will describe those who are using more historic technologies companies that are using current collaboration tools for connecting their SC to other global SCs and the SCs that are moving more towards cutting edge technologies This book will be a handbook for practitioners a teaching resource for academics and a guide for

military contractors Some figures in the eBook will be in color Presents a decision model for choosing the best Supply Chain Engineering SCE strategies for Service and Manufacturing Operations with respect to Industrial Engineering and Operations Research techniques Offers an economic comparison model for evaluating SCE strategies for manufacturing outsourcing as opposed to keeping operations in house Demonstrates how to integrate automation techniques such as RFID into planning and distribution operations Provides case studies of SC inventory reductions using automation from AIT and RFID research Covers planning and scheduling as well as transportation and SC theory and problems Electronic Systems Quality Management Handbook Marsha Ludwig-Becker, 1997 Annotation Quality management for electronic systems has grown far beyond the basic inspection techniques of the past New performance based quality management approaches are now used at every electronics company from huge corporations to small start ups This book goes beyond generic quality approaches to present an electronics specific program for quality management Failure Analysis - Structural Health Monitoring of Structure and Infrastructure Components Gobinath Ravindran, Vutukuru Mahesh, Moustafa Moufid Kassem, 2023-10-18 Failure Analysis Structural Health Monitoring of Structure and Infrastructure Components is a collection of chapters written by academicians researchers and practicing engineers from all over the world The chapters focus on some developments as well as problems in structural health monitoring SHM in civil engineering structures and infrastructures The book covers a variety of multidisciplinary topics including SHM risk analysis seismic analysis and various modeling and simulation methodologies This book is an excellent resource for undergraduate and postgraduate students academics and researchers across a wide variety of engineering disciplines as well as for practicing engineers and other professionals in the engineering industry **Managing Six Sigma** Forrest W. Breyfogle, III, James M. Cupello, Becki Meadows, 2000-10-11 Advance Praise for Managing Six Sigma This book is a unique blend of practical knowledge and cultural change revolution and evolution strategies I recommend that serious managers buy the book spend some serious time reading and then go out and use its lessons to make a name for themselves William Baker Benchmarking Knowledge Transfer Office Raytheon Corporation I believe Managing Six Sigma will be the new reference standard for the quality movement in coming years Robert T Hunter Executive Vice President Rehnborg Center for Nutrition and Wellness The authors step by step process for integrating the tools of Six Sigma takes the mystery out of this methodology and by itself makes this book worth having Dennis Adsit PhD Vice President Quality Intuit Breyfogle s Six Sigma deployment methodology is explained in detail for four different business processes manufacturing service transactional and development His 21 step plan for each business process is explained in a way that allows any type of company to perform a successful implementation Mark Feller Director of Quality Baker Electronics Breyfogle teaches not only the wider application but also the deeper implications and in depth implementation of Six Sigma deployment in organizations large and small Ram Josyula President gelrad.com Managing Six Sigma is the only book that provides both detailed coverage of Six Sigma techniques and effective methods for managing those who implement

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