Third edition
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Control charts —

Part 1: General guidelines

Cartes de contrôle —

Partie 1: Lignes directrices générales

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 4, *Applications of statistical methods in process management*.

This third edition of ISO 7870-1 cancels and replaces the second edition (ISO 7870-1:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Added Annex A, specifying the conventions for drafting control charts.

A list of all parts in the ISO 7870 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Every production, service, or administrative process contains a certain amount of variability due to the presence of a large number of causes. The observed results from a process are, as a result, not constant. Studying this variability to gain an understanding of its characteristics provides a basis for taking action on a process.

Control charts are a fundamental tool of statistical process control (SPC). They provide a simple graphical method that can be used to

a) indicate if the process is stable, i.e. operating within a stable system of random causes, also known as inherent variability and referred to as being in a “state of statistical control”,

b) estimate the magnitude of the inherent variability of the process,

c) compare information from samples representing the current state of a process against control limits reflecting this variability, with the objective of determining whether the process variability has remained stable or is reduced or increased,

d) identify, investigate, and possibly reduce/eliminate the effect of special causes of variability, which can drive the process to an unacceptable level of performance,

e) aid in the regulation of a process through the identification of patterns of variability such as trends, runs, cycles, etc.,

f) determine if the process is behaving in a predictable and stable manner so that it will be possible to assess if the process is able to meet specifications,

g) determine whether or not the process can be expected to satisfy product or service requirements and process capability for the characteristic(s) being measured,

h) provide a basis for process adjustment through prediction using statistical models, and

i) assist in the assessment of the performance of a measurement system.

A major virtue of the control chart is its ease of construction and use. It provides the production or service operator, engineer, administrator, and manager with an online indicator about the behaviour of the process. However, in order for the control chart to be a reliable and efficient indicator of the state of the process, careful attention has to be paid at the planning stage to such matters as selecting the appropriate type of chart for the process under study and determining a proper sampling scheme.

General concepts useful to a successful design of a control chart are presented in Annex A.