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Smernice za uvajanje statističnega obvladovanja procesov (SOP) - 2. del: Katalog orodij in tehnik

Guidelines for implementation of statistical process control (SPC) - Part 2: Catalogue of tools and techniques

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Lignes directrices pour la mise en oeuvre de la maîtrise statistique des processus (MSP) - Partie 2: Catalogue d'outils et de techniques

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Part 2:
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11462-2 was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 4, *Applications of statistical methods in process management*.

ISO 11462 consists of the following parts, under the general title *Guidelines for implementation of statistical process control (SPC)*:

— *Part 1: Elements of SPC*

— *Part 2: Catalogue of tools and techniques*

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Guidelines for implementation of statistical process control (SPC) —

Part 2:
Catalogue of tools and techniques

1 Scope

This part of ISO 11462 provides a catalogue of tools and techniques to help an organization in planning, implementation and evaluation of an effective statistical process control (SPC) system. This catalogue gives tools and techniques that are essential for the successful realization of the SPC elements specified in ISO 11462-1.

2 Normative references

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The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability*

ISO 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3534-1 and ISO 3534-2 apply.

4 Symbols and abbreviated terms

ANOM   analysis of means

ANOVA   analysis of variance

c chart   count control chart

CDF   cumulative distribution function

C_p process capability index

C_{pk} minimum process capability index

CTQ   critical to quality

EWMA   exponentially weighted moving average

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EWMA chart	control chart using the exponentially weighted moving average
FMEA	failure modes effect analysis
FMECA	failure modes effect and criticality analysis
FTA	fault tree analysis
Me chart	control chart using the sample median Me
MR chart	control chart using the moving range MR
np chart	number of categorized units control chart
p chart	proportion categorized units control chart
P chart	percent categorized units control chart
P_m	machine performance capability index
P_{mk}	minimum machine performance capability
P_p	process potential index
P_{pk}	process performance index
PDPC	process decision program chart
QC	quality control
QFD	quality function deployment
R chart	control chart using the sample range R
s	standard deviation, realized value
s chart	control chart using the standard deviation, realized value
SPC	statistical process control
u chart	count per unit control chart
X	individual measured value
$\bar{X}$	(Xbar) subgroup average
$\bar{X}$ chart	control chart using the sample average $\bar{X}$

5 Purpose of the catalogue

This catalogue is intended to be used as a guideline in the quality planning, process control and continual improvement phases, to assist in problem identification and solving in operational activities with the use of statistical process control (SPC) methods.

The techniques listed in this part of ISO 11462 enable an organization to bring their processes under statistical control and, in the state of prediction, conduct a process capability assessment against technical requirements, and determine the inherent process capability and reliability. It provides a means for management to effectively increase the knowledge of processes producing critical to quality (CTQ) product or process parameters. This process capability knowledge may be used to assist in specifying tolerances or to assess feasibility.

Statistical process control is often called the voice of the customer because it signals when a process has gone out of control, enabling the process operator/owner to investigate the cause and correct the process to bring it back into control. By reducing the special causes of the out-of-control state, it enables management to take improvement actions to reduce common cause variation.

Processes that are reliable, predictable and capable provide the organization with more efficient, effective and economic performance, and enhanced customer satisfaction.

The catalogue in this part of ISO 11462 gives guidelines for organizations to use in the planning, development, execution and evaluation of a statistical process control system. In practice, the seven QC tools are used on a continual basis and cover the majority of problems and tasks. However, there are occasions when the full range of tools listed in the catalogue has applications. This catalogue is intended to be helpful in finding the applicable standard.

6 Classification of quality tools and techniques

See Table 1.

Table 1 — Classification of quality tools and techniques

	Element	Statistical tool and technique	Reference
6.1	Demerit control chart	Audit tools	
6.2	p control chart	Control charts for attributes data	ISO 7870-1 ISO 8258[a]
6.3	np control chart	Control charts for attributes data	ISO 7870-1 ISO 8258[a]
6.4	c control chart	Control charts for attributes data	ISO 7870-1 ISO 8258[a]
6.5	u control chart	Control charts for attributes data	ISO 7870-1 ISO 8258[a]
6.6	$\bar{X}$ (Xbar) and s control chart	Control charts for variables data (often used in mechanized devices)	ISO 7870-1 ISO 8258[a]
6.7	Control chart, multiple-attribute/demerit/weighted	Control charts for attributes data	ISO 7870-1 Future ISO 7870-5[c]
6.8	Pareto control chart	Analysis of criticality and significance	ISO 8258[a]
6.9	Group short-run moving average (or median) and moving range	Control charts for small sample data	Future ISO 7870-5[c]
6.10	Acceptance control chart	As in ISO 8258[a] and ISO 7966[b]	ISO 8258[a] ISO 7966[b]

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