Literature review of Process Capability Databases

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(Dated: 24 July 2013)

Summery of literature on Process Capability Databases (PCDB). Why are PCDB's needed, what are the common configurations and what are the typical problems related to PCDB.

I. INTRODUCTION

Sfantsikopoulos (1990) Develops a model for the Tolerance - Price relationship and based on 5 different sources gives a range of parameters.

Kern (2003) has created a great well structured literature review of related work to PCDB and which fields of knowledge has interest in the PCDB data. He proposes a structure for the actual database scheme, which is useful as inspiration. To assign key features he develops a Matrix system, which seems very time consuming and complex. Kern (2003) also develops a framework to calculate Process mean and variance output based on variance and mean in. This could be very useful if only the variance and mean input it known.

A tolerance grade guide base on machining operation can be found in Institute (1978). It is however unclear how the data for the table has been generated. It also showed in of America Standards Institute. Sectional Committee on the Standardization of Allowances, for Cylindrical Parts, and Limit Gages (1967) in a slightly reduced form.

Tata and Thornton (1999) Summery of M. Tata's Master project, published in article form. Based on a survey send to major design and manufacturing firms. The problems of current PCDB implementations are investigated.

In Oberg *et al.* (2008, p. 715) you will find a figure showing the surface roughness from common production methods. From 50 Ra to 0.012. No source is given.

Arvidsson and Gremyr (2008) has carried out a literature review of what Robust Design is.

Thornton (2004) Whole appendix B is dedicated to PCDB design.Introduces concepts of Product Key chateristics and methods on how to manage these.

Feng and Yang (1995) A proposed Data model for integrating Tolerance specification into CAD data.

Yang and Tarng (1998) Example of Taguchi in use.

Kane (1986) One of the most cited articles on Process capability indices. One of the first in English literature (Cp, Cpk)

Thornton, Donnelly, and Ertan (2000)Study based on American fortune 500 and aerospace companies shows that they need "better low cost, systematic, and quantitative methods in all stages of variation risk management"

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