AIAG issued a 2nd Edition of the Statistical Process Control Reference Manual (July 2005). Originally issued in 1991, the SPC Reference Manual was one of the first manuals that was created and published by the then “Big 3” of Ford, Chrysler and GM. Many changes were made that not only updated and streamlined the manual, but that also added many more statistical methods to the manual. These changes improved the format to create an editable document for future revisions and focused the underlying theme of prevention verses detection in a process control system.

**A Reference Manual - Not a Standard**

First and foremost, it must be understood that this is a reference manual. It is not a SPC standard. As a reference manual it is not intended to limit the evolution of SPC methods suited to particular processes or commodities. If a new SPC method is developed that is not included in the manual and your customer approves it, by all means, use the new method if it is better suited to your process or product.

A significant amount of material was removed during the updating of the manual to the 2nd edition. The first edition featured step-by-step instructions on how to fill out the eight basic control chart forms. These instructions for how to fill out the forms were much too detailed for a reference manual and were removed to streamline the manual. In addition, the authors recognized that most companies have already developed their own internal training materials for completing SPC forms.

Other changes include the revision of the formatting of the manual to indent the text similar to other AIAG manuals. The updated quality of the graphics and examples help to make the manual much more user friendly. An added feature of the 2nd edition is the use of a “key symbol” in the right hand margin of the pages. This key symbol is used to note information that the authors felt was extremely important for the users of the manual.

**Added Methods and Controls**

The manual still contains the basic control charts for variable charting such as average and range charts, average and sigma charts, median and range charts, and individual and moving range charts. The basic attribute charts of p, np, c, and u charts were also retained. The new manual includes the additional methods and tools of probability-based charts, short-run charts, charts for detecting small changes, non-normal charts, multivariable charts, regression control charts, and zone charts.

The addition of the new methods really opens the door for application of SPC techniques on processes and products that may not have been previously charted and controlled. The probability control charts include applications for stop light control charts and pre-control charts that can easily be implemented on a gage system. The short-run charts are geared for use in engineering development, JIT short production runs and job shops. Charts for detecting small changes feature the CUSUM (Cumulative Sum) chart and the EWMA (Exponentially Weighted Moving Average) charts. The use of non-normal charts highlights the use of Shewhart control charts. The multivariate control charts allow for simultaneous control of two or more related characteristics that influence the performance of either a process or product. Finally, the regression control charts note the alternative approach of residual charts.
The 2nd Edition of the manual details the calculations for Cp, Pp, Cpk and Ppk and includes an explanation of what process capability is. The explanation of capability includes the indices for both bilateral and unilateral distributions as well as how to handle non-normal and multivariate distributions. The 2nd Edition of the SPC Reference Manual is a much-improved manual from the first edition. It was streamlined to take out unneeded detail. It added many more methods and tools for SPC which are more suited to specific processes and commodities. Finally, the expanded information on process capability is a great benefit to its users.

For more information, call toll free (U.S. only) 888.673.9000, ext. 6881 or worldwide at +1.734.827.6881, or email information@nsf-isr.org.

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