FOREWORD

(This Foreword is not a part of American National Standard Z1.1-1985 Guide for Quality Control Charts, nor of American National Standard Zl.2-1985 Control Chart Method of Analyzing Data, nor of Zl.3-1985 Control Chart Method of Controlling Quality During Production.)

Upon request by the War Department, the American Standards Association, in December, 1940, initiated a project on the application of statistical methods to the quality control of materials and manufactured products. Since, due to the national emergency, there was an urgent need for the prompt development of standards in this field, the ASA Defense Emergency Procedure (later called the War Emergency Procedure) was applied to this project, and the following Emergency Technical Committee (later, War Committee) was appointed to develop such standards:

H.F. Dodge, Bell Telephone Laboratories, Inc, Chairman
A.G. Ashcroft, Alexander Smith and Sons Carpet Company
W. Edwards Deming, Bureau of the Census
Leslie E. Simon, Ordnance Department, U.S. Army
R.E. Wareham, General Electric Company
John Gaillard, American Standards Association, Secretary

This committee developed these three standards. Drafts were submitted for criticism and comment to a number of key individuals in groups having a substantial interest in the subject of the standards. All of the comments were carefully reviewed by the committee and a number of changes were made in accordance with suggestions received. The revised drafts of Z1.1 and Z1.2 were unanimously approved by the Emergency Technical Committee and received ASA approval as American Defense Emergency Standards (later, War Standards) on May 27, 1941. Zl.3 was first approved in 1942.

In November, 1952, the ASA invited the American Society for Quality Control (ASQC) to accept the proprietary sponsorship for the three standards which had been developed by the War Committee. The invitation was accepted by ASQC in February, 1953, and the standards were turned over to the ASQC Standards Committee who assigned the designations ASQC Bl, ASQC 82, and ASQC B3 to the standards which were later to become ANSI standards Z l. l, Zl.2 and 21.3 respectively. The personnel of the committee at that time was as follows:

Irving W. Burr, Purdue University
W. Edwards Deming, Consultant in Statistical Surveys,
New York University
Harold F. Dodge, Bell Telephone Laboratories, Inc (retired) and
Rutgers, The State University of New Jersey, Chairman
Eugene L. Grant, Stanford University
Ralph E. Wareham, Consultant in Quality Control

One of the duties of the ASQC as Proprietary Sponsor was the establishment of a national consensus on approval of the standards by industry. In August, 1956, a canvass of industry was instituted in which organizations believed to have a substantial interest in the subject of quality control were contacted. This canvass resulted in all but three of the organizations interested approving the standards as circulated by the ASQC. After further review by the Standards Committee of ASQC, in the light of comments received in the course of the canvass, the ASQC felt that the basic criticisms had been covered by making minor modifications and bringing the appendixes up to date, and accordingly submitted the standards to ASA for approval as American Standards. In the course of considering the submittal for a recommendation on approval, the Miscellaneous Standards Board, which had jurisdiction over this work, requested that those organizations which had objected be contacted again to ascertain their present feelings in the matter. This was done with the result that the organizations involved announced that they now approved the standards.

Accordingly, after receiving a favorable recommendation from the Miscellaneous Standards Board, the American Standards Association approved the standards as American Standards on November 21, 1958.

In 1981, the ANSI Z1 Statistical Methods Subcommittee recommended to the ASQC Standards Committee that the standards Zl.l. Guide For Quality Control, Zl.2, Control Chart Method of Analyzing Data and Zl.3, Control Chart Method of Controlling Quality During Production can be updated to include more modern terminology and symbols in keeping with ANSI/ ASQC A 1-1978, American National Standard, Definitions, Symbols, Formulas and Tables for Control Charts and other publications such as the ASTM STP15D, ASTM Manual on Presentation of Data and Control Chart Analysis.

The task was assigned to the ASQC Statistics Division which formed a writing committee that completed the task of updating these standards. The writing committee combined the three standards, Z1.1, Z1.2, and Z l. 3 under one cover as had been done previously with Z1.1 and Z1.2, because all three documents are concerned with statistical quality control charts.

The significant changes are: (1) the redefinition of the sample standard deviation to be $s = \sqrt{\Sigma(X - \bar{X})^2/(n-1)}$; (2) the use of the words nonconforming and nonconformities to replace defectives and defects respectively; (3) the use of a subscript (0) to replace the prime symbol (') e.g. p_o used in the place of p', for designating a standard value, and (4) the amplification of the material on Warning Limits.

The redefinition of the sample standard deviation also required changing many factors used in control chart work (c. in place of c,; Ai in place of A,; B, and B, in place of B, and B, respectively; E_i in place of E,). Table 6 *Factors for Computing Control Chart Lines* and the Table A2 in the Appendix now use the updated factors.

The above changes required many changes in these Standards.

SCOPE

The scope of this document is intended to cover the Shewhart Statistical Quality Control Charts which are in general use in the United States manufacturing and service industries.

WRITING COMMITTEE

The following individuals were members of the writing committee for this revision of ANSI Z1.1, Zl.2 and Z1.3 1958:

Sherman L. Babcock, Chairman
Hardy M. Cook, Jr.
Acheson J. Duncan
C. Allen Mannon
Harrison M. Wadsworth, Jr.
Oswald Willner

Suggestions for improvement of this standard will be welcome. They should be sent to the American Society for Quality Control, 230 West Wells Street, Milwaukee, WI 53203.