Defects Per Unit u Chart

Like the count of defects c Chart described in the previous section, the u Chart describes the number of defects per unit. It is assumed that the number of units observed is the same for all samples. We will use the file labeled Defects.LAZ as our example. In this set of data, 28 observations of defects for 1000 units each are recorded. The assumption is that defects are distributed as a Poisson distribution with the mean given as

$$\bar{u} = \frac{\Sigma c}{\Sigma n}$$ where c is the count of defects and n is the number of units observed.

and

$$UCL = \bar{u} + sigma / \sqrt{\frac{\bar{u}}{n}} \qquad \text{and LCL} = \bar{u} - sigma / \sqrt{\frac{\bar{u}}{n}}$$

The specification form and results for the computation following the click of the Compute button are shown below:

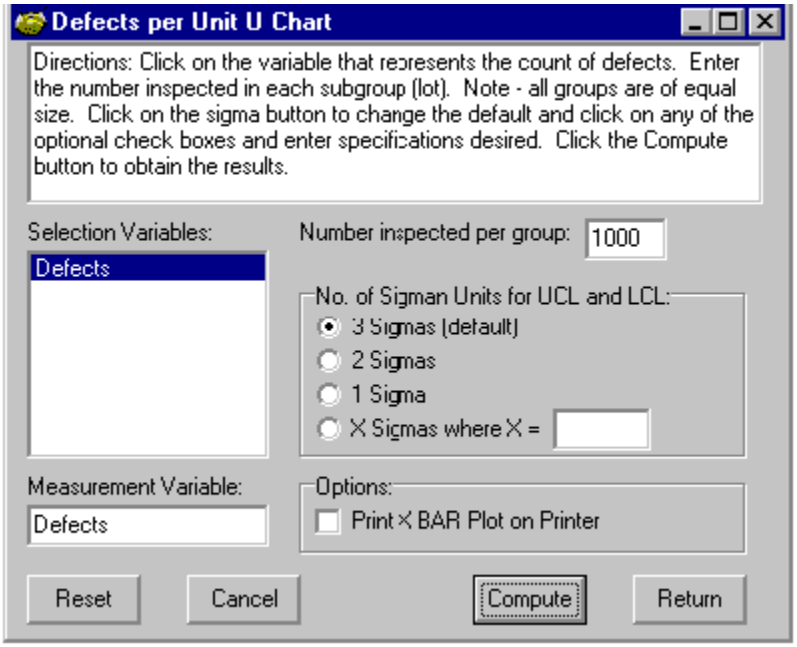

Figure 1 Specification Dialog for an SPC Defects per Unit (U) Chart

Sample	No Defects	Defects Per Unit
1	12.00	0.01
2	15.00	0.01
3	8.00	0.01
4	10.00	0.01
5	4.00	0.00
6	7.00	0.01
7	16.00	0.02
8	9.00	0.01
9	14.00	0.01
10	10.00	0.01
11	5.00	0.01
12	6.00	0.01
13	17.00	0.02
14	12.00	0.01
15	22.00	0.02
16	8.00	0.01
17	10.00	0.01
18	5.00	0.01
19	13.00	0.01
20	11.00	0.01
21	20.00	0.02
22	18.00	0.02
23	24.00	0.02
24	15.00	0.01
25	9.00	0.01
26	12.00	0.01
27	7.00	0.01
28	13.00	0.01
29	9.00	0.01
30	6.00	0.01

Total Nonconformities = 347.00
No. of samples = 30
Def. / unit mean = 0.012 and variance = 0.003
Lower Control Limit = 0.001, Upper Control Limit = 0.022

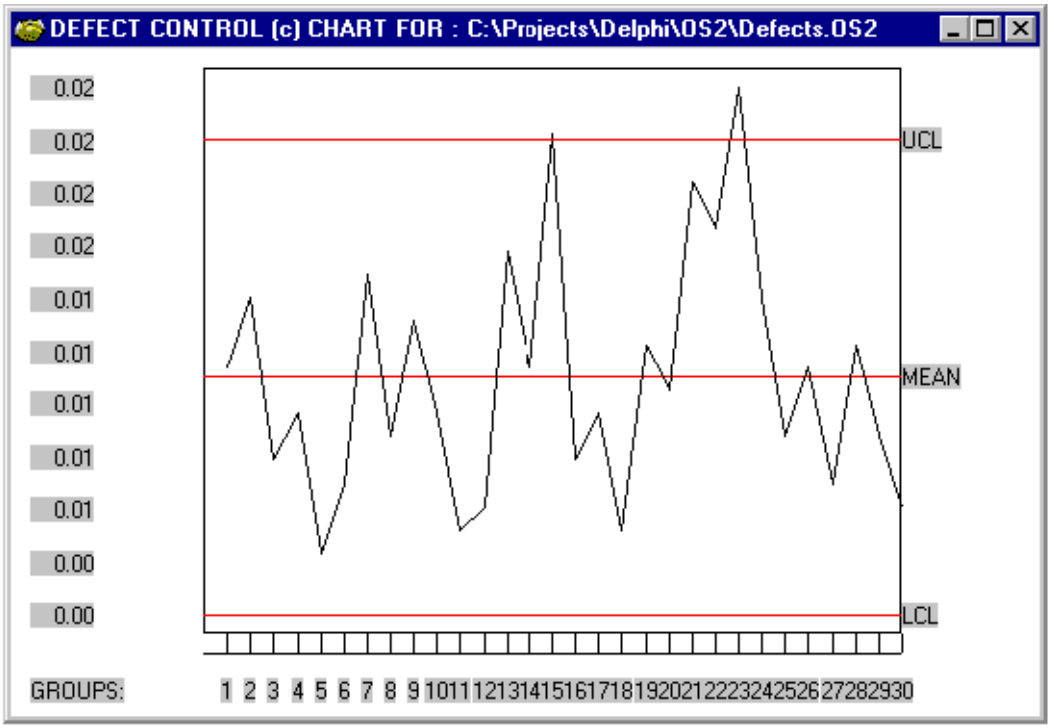

Figure 2 An SPC U Chart