# Case I: Weibull Distribution

## ARL Table for shape parameter increase from the in-control value in Wei(1.1,1.6)

| | | $n=5$ | | | | $n=10$ | | | | $n=20$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ chart | | $\tilde{X}$ chart | | $\bar{X}$ chart | | $\tilde{X}$ chart | | $\bar{X}$ chart | | $\tilde{X}$ chart | |
| $\alpha$ | $\mu_X$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ |
| **1.00** | **1.60** | 96.90 | 198.70 | 97.53 | 198.79 | 99.19 | 198.25 | 100.16 | 203.43 | 98.29 | 194.86 | 100.04 | 201.35 |
| **1.05** | **1.57** | 145.13 | 351.42 | 139.31 | 225.92 | 147.98 | 380.98 | 141.85 | 192.64 | 144.81 | 400.61 | 117.98 | 140.40 |
| **1.10** | **1.54** | 214.85 | 644.24 | 185.26 | 253.95 | 214.34 | 741.36 | 157.07 | 176.54 | 201.93 | 849.33 | 94.44 | 97.88 |
| **1.15** | **1.52** | 310.64 | 1210.17 | 238.39 | 287.26 | 307.02 | 1504.46 | 157.72 | 165.09 | 269.26 | 1894.68 | 70.10 | 69.17 |

## ARL Table for scale parameter increase from the in-control value in Wei(1.1,1.6)

| | | $n=5$ | | | | $n=10$ | | | | $n=20$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{X}$ chart | | $\tilde{X}$ chart | | $\bar{X}$ chart | | $\tilde{X}$ chart | | $\bar{X}$ chart | | $\tilde{X}$ chart | |
| $\beta$ | $\mu_X$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ | $ARL$ | $ARL^+$ |
| **1.6** | **1.6** | 96.90 | 198.70 | 97.53 | 198.79 | 99.19 | 198.25 | 100.16 | 203.43 | 98.29 | 194.86 | 100.04 | 201.35 |
| **1.8** | **1.8** | 59.96 | 73.62 | 71.08 | 87.53 | 50.40 | 57.00 | 58.21 | 65.04 | 36.11 | 38.30 | 38.07 | 39.72 |
| **2.0** | **2.0** | 32.31 | 34.94 | 43.02 | 45.77 | 21.28 | 22.12 | 25.56 | 25.91 | 12.03 | 11.89 | 11.85 | 11.66 |
| **2.2** | **2.2** | 18.40 | 18.83 | 25.70 | 26.83 | 10.57 | 10.57 | 12.33 | 12.43 | 4.97 | 5.02 | 4.61 | 4.63 |
| **2.4** | **2.4** | 11.51 | 11.47 | 16.75 | 16.87 | 5.82 | 5.98 | 6.61 | 6.58 | 2.46 | 2.46 | 2.13 | 2.14 |
| **2.6** | **2.6** | 7.55 | 7.66 | 11.23 | 11.22 | 3.65 | 3.57 | 3.91 | 3.88 | 1.35 | 1.37 | 1.09 | 1.10 |