***Steady-State Out-of-Control Comparison Study***

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| **Description:** Here, we assume that the process is still in-control during the early stage of Phase-II monitoring. The out-of-control sample only occurred starting the 50th or 100th test sample. Hence, we denote these two possibilities as and , respectively. We only consider for this study.  We compare the performance of various schemes below:  : EWMA-Lepage scheme with a time-varying upper control limit  : EWMA-Lepage scheme with a steady-state  : DEWMA-Lepage scheme with a time-varying  : DEWMA-Lepage scheme with a steady-state  : HWMA-Lepage scheme with a time-varying  : HWMA-Lepage scheme with a steady-state  We compare these schemes by comparing the -average run length , conditional expected delay (CED), -50th percentile , and -95th percentile . |
| **Note:** The selection of the value for each scheme depends on the following designs:  Design I: (i) ; (ii) ; and (iii) .  Design II: (i) ; (ii) ; and (iii) .  Design III: (i) ; (ii) ; and (iii) .  Design IV: (i) ; (ii) ; and (iii) . |

Normal distribution

Consider , by assessing , generally, it appears as

Design I

1. The and schemes are competitively good in most cases.
2. The scheme is superior in detecting a small and pure shift in the location parameter.
3. However, for other shift sizes, the scheme is poorly performing as the scheme.

Design II

We conclude more or less the same findings as in Design I, just that the value of the smoothing parameter change.

Design III

The smoothing values are exactly the same as in Design I; please refer to the findings of Design I.

Design IV

Only scheme is feasible.

Note that more or less the same findings are obtained if we consider .

Laplace and Shifted Exponential distributions

By assessing , generally, the findings are more or less the same as under the Normal distribution, regardless of the value of considered in this study.

Cauchy distribution

By assessing , generally, the findings are more or less the same as under the Normal distribution, regardless of the value of considered in this study, with a remark, i.e., the scheme performs the best in a wider range of as compared to other distributions.