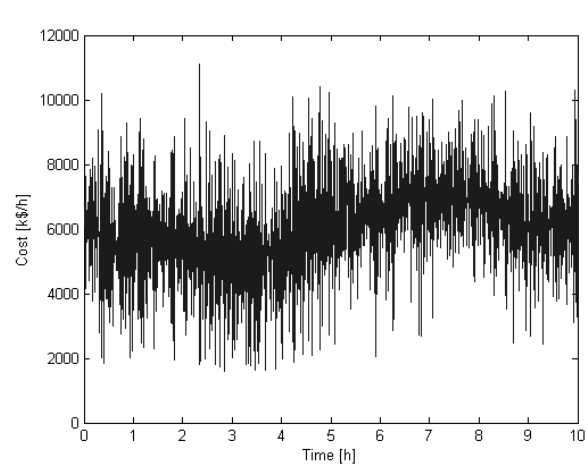

Figure 11. Profile of operating cost under measurement noise – filter type 2

Again in this simulation (for type 2 filter), a performance improvement is also indicated by the narrowest range achieved of gradient controlled variable (Figure 10) compared to unfiltered (Figure 6) and use of type 1 filter (Figure 8)

Table 5. Operating cost comparison for a 10 h period

Case Studies	Cost [$]
Without noise	60487
With noise, without filter	60630
With noise, filter type 1	60590
With noise, filter type 2	60578

5. CONCLUSIONS

Reducing the efforts of measurement noise on plantwide control performance through signal filtering is investigated in this paper. In this work, the self optimizing control structure of Cao (2004) is adopted. It is shown that the calculation of the gradient function can be sensitive to measurement noise and this deteriorates the control performance. Through filtering the process measurements, the self optimising control performance can be improved. Simulation results show that filtering the process measurements used in gradient function calculation can save about $124.8 per day in the total operating cost. This would be significant from a larger capacity and long term operation point of view.

ACKNOWLEDGMENT

This work was supported by Technological and Professional Skills Development Sector Project (TPSDP) – ADB Loan No.1792 – INO. This support is gratefully acknowledged.

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