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Hazardous emissions monitoring and control

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There is an increasing awareness in society of the need to protect our fragile environment. Meeting environmental requirements is recognised as one of the six 21st century business drivers for automatic control. Chemical companies, for example, use automatic control to minimise waste production because of increasing prohibitions against discharge and/or disposal of toxic substances. New plants are moving towards a “zero-discharge” concept [1]. In a recent report [2], greater emphasis on automatic control is suggested as a technological response of both the speciality chemicals and pharmaceutical sub-sectors to key business drivers up to 2015.

This contribution will report on recent developments in the monitoring and control of hazardous emissions (such as SO₂ and NO_x, amongst other pollutants). The contribution will firstly introduce the regulatory environment, which is driven by the EU commitment to the Kyoto protocol, the integrated pollution prevention and control licensing requirements of the EPA and, indeed, wider social pressures. Manual sampling to estimate pollutant levels is increasingly costly. Thus, new detectors and sensors have been introduced, which facilitate the development of a continuous emissions monitoring system (CEMS); the wider CEMS technology and typical CEMS computer interfaces will also be reported. Finally, recent developments in prediction emissions monitoring systems (PEMS) will be considered; such systems predict the concentration and emission rate of contaminant(s) based on correlation(s) with other monitored parameters.

References:

1. Edgar, T.F. (2004). “Control and operations: when does controllability equal profitability?”, *Computers and Chemical Engineering*, Vol. 29, pp. 41-49.
2. Technology Foresight Ireland – Report on the Chemical/Pharmaceutical Panel (1999), Forfas, <http://www.forfas.ie/icsti/statements/tforesight/chem/sectort.htm>