COMPUTER SUPPORTED INFORMATION SYSTEM FOR MEASURING POLLUTION PREVENTION PROGRESS

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The objective of this research is to build an information system (IS) for pollution prevention (P2) which comprises a simulation model of an industrial production and waste generation system (IPWGS). An IPWGS model is used to predict waste generation, carry out cost-analysis of already existing waste management practices, and after applying appropriate P2 strategies and technologies, measure P2 progress. An IS for P2 could provide industry, research organizations, and governmental institutions with a powerful tool for implementation of P2 strategies and introduction of efficient waste reduction/minimization practices by: (1) predicting waste generation in industrial production, (2) introducing process optimization while minimizing waste generation in production processes, (3) suggesting the application of P2 strategies and technologies, and (4) measuring P2 progress.

The essential part of the IS is a model of an IPWGS. Current research is applying systems analysis approach to quantify parameters in an IPWGS. However, system inputs (raw and other materials) as well as system outputs (products, by-products, process losses, waste, emissions, discharges, nonproducts, releases) are not always precisely defined nor yet standardized. Moreover, environmental costs are usually not placed into separate accounts and real costs of the waste generation and its management are hardly ever considered. Therefore, the main parameters of an IPWGS model are defined and the boundaries of such a system are determined. A model is tested in a selected industrial production process, cost-analysis of waste management is carried out, and after applying P2, source reduction, waste minimization and/or resource recovery measures, P2 progress will be measured. Computer simulation is applied to study the system capability and behavior under a variety of conditions. The model for measuring of waste generation/P2 in an industrial production is a basic part of a IS.

Commercially available database management systems (DBMS) for IS building and dynamic simulation software applicable on IBM PC are analyzed. ACCESS and ITHINK are selected for this purpose.