

Environmental Management Systems

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Introduction:

Environmental management practices have evolved greatly over the past 30 years. Initially, environmental management was viewed as a burden to facilities as they spent capital on end-of-pipe pollution control equipment that did not add to the value of their output. More recently, environmental management has focused on pollution prevention, and organizations have welcomed the cost savings often found through the efforts of environment, health, and safety departments. Today, environmental management is undergoing another change, to a systems approach encompassing all activities that have an environmental impact. Companies have initiated environmental management systems to demonstrate their commitment to continuous care and improvement of the environment.

Objectives of Research:

We address two crucial questions: what role can environmental management systems play in business operations, and how environmental management systems are affecting environmental performance. First, the design of environmental management systems varies across organizations, to include different levels of activities and personnel and different types of information. We hypothesize that an integrated environmental management system focused on reducing discharges will improve not only environmental impacts, but also productivity and quality of output. Secondly, while traditional environmental regulations require reductions to specific levels, environmental management systems tend to focus on continuous improvement usually beyond compliance. But does an environmental management system guarantee better environmental quality? We investigate how environmental management systems measure improvements in environmental impact, and how environmental management systems compare to existing regulations.

Approach:

In past work, we have approached examination of environmental management systems by creating management tools. These tools provide companies with knowledge of environmental impacts that are typically overlooked in traditional business accounting and information frameworks. Mass balance exercises consider the inputs and outputs of a process or facility and determine how effectively materials are being utilized. Mass balances indicate where materials are discharged or emitted and lead to wasted time and money. Full cost accounting assigns the costs of materials, energy, labor, waste disposal, and other costs

to specific products or processes instead of lumping them in an overhead account. By assigning costs to activities or outputs, the true burden of environmental impacts can be recognized and improved. A new focus for our research is benchmarking activities. One project is comparing U. S. facilities to similar Mexico facilities to determine how environmental management systems influence environmental discharges and impacts when regulatory requirements are different. A second project is creating an internal benchmark system to show changes in environmental impacts over time in a single facility while accounting for product and process technology changes. Another focus is on how the organizational structure of a firm is influenced by an environmental management system and how the information from the environmental management system is used for better business decision making.

Conclusions:

Investigation of environmental management systems is an ongoing effort of the Green Design Initiative. As organizations continue to develop their operations to accommodate environmental impacts in decisions, we will continue to work with them. Both in engineering and management fields, we are dedicated to improving the impact of business operations on the environment on all scales.



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