عنوان مقاله:

Development of a software tool for economic evaluation of health, safety, and environmental initiatives in a combined cycle power plant

محل انتشار:

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خلاصه مقاله:

Background: This study aimed to provide a comprehensive tool for the economic evaluation of investments in health, safety, and environment (HSE). Methods: This developmental cross-sectional study was conducted on the costs and benefits of HSE investments in a combined cycle power plant in Gilan province, ۲۰۲۱. The components of preventive measure costs (PMCs) and occupational accidents, diseases, and environmental pollution costs (ADPCs) were determined by an expert panel and review of scientific literature. The HSE economic assessment tool (HSE-EAT) was developed in Microsoft Excel software using macro/visual basic coding. The tool was designed to determine the efficient measures using the cost-benefit analysis (CBA) and the combination of control measures with the highest financial benefits using the cost-effectiveness analysis (CEA). Results: The application of the HSE-EAT in a combined cycle power plant showed the highest return on investment (ROI) for installation of drains for ducts of diesel fuel pipes and the lowest ROI value for renovation of emergency eyewash and shower. The ratio of indirect to direct benefits of implementing the preventive measures in the worst-case and best-case scenarios were ۳.۰ and ۱.۳, respectively. Conclusion: The HSE-EAT exhibited the advantages of comprehensiveness, flexibility, being userfriendly, and faster and more accurate calculations and could be also used for economic evaluation of health, safety and environmental initiatives in other industries and organizations.

کلمات کلیدی:

Cost-benefit analysis, Environmental pollution, Occupational accidents, Power plants, Software