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ENVIRONMENTAL FAILURE MODES AND EFFECTS ANALYSIS (FMEA) AND ITS APPLICATIONS. A COMPREHENSIVE LITERATURE REVIEW

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Abstract

The rapid growth of the world economy contributed to environmental damage resulting in global warming and climate change as well as worsening air and water quality. Moreover, the tendency to increase environmental threats caused by population growth, agriculture and heavy pollution industries proves the importance of the Environmental Failure Modes and Effects Analysis (EFMEA) method. Therefore, it is necessary to raise awareness and popularize its use. The aim of the study was to recognize the directions and trends in the development of papers and research worldwide on the application of the Environmental FMEA method. The study was based on the reporting system of systematic reviews and meta-analysis (PRISMA). The review of the literature showed that EFMEA is used in various industries. The number of publications on EFMEA is growing, but the low number overall proves that there is still insufficient experience in this field. Due to the lack of studies from the area of Central Europe, the recommendations need to be based on the experience of other foreign centres, mainly from Iran. Studies from this country were the most prevalent among those selected for this review. The majority of papers are related to the environmental risk assessment in the energy and petrochemical industries. There are isolated cases of using the EFMEA method in the chemical or food industry. The vast majority of the studies undertaken are very extensive, paying attention to a wide spectrum of threats contributing to the occurrence of a given environmental risk. It was observed that EFMEA is integrated with other methods, which gives a synergy effect, contributing to the acquisition of better and more comprehensive knowledge about researched problem.

Key words: effect analysis, environmental failure, process, product, risk assessment

Received: March, 2021; Revised final: September, 2021; Accepted: October, 2021; Published in final edited form: March, 2022
