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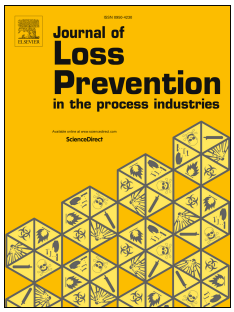

Life extension decision making of safety critical systems: An overview

Mahmood Shafiee, Isaac Animah

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Life extension decision making of safety critical systems: An overview

Mahmood Shafiee* , Isaac Animah

Cranfield University, College road, Bedfordshire MK43 0AL, United Kingdom

Corresponding author, Tel: +44 1234 750111 ; Email: m.shafiee@cranfield.ac.uk

Abstract

In recent years, the concept of "asset life extension" has become increasingly important to safety critical industries including nuclear power, offshore oil and gas, petrochemical, renewable energy, rail transport, aviation, shipping, electricity distribution and transmission, etc. Extending the service life of industrial assets can offer a broad range of economic, technical, social and environmental benefits as compared to other end-of-life management strategies such as decommissioning and replacement of equipment. The aim of this paper is to present a comprehensive literature review and classification framework for academic research and industrial practices related to life extension of safety critical systems and installations. To achieve this, a systematic review is performed on the current state-of-the-art and new developments in the field of asset life extension in various industries. Major sources from which the literature can be gathered are identified and some assessment criteria are defined to categorize the selected publications. A classification framework is then proposed to support life extension decision making process with respect to the type of asset and industry sectors where the concept of life extension has been of interest, condition assessment techniques used for qualification of assets for life extension, life prediction models, life extension strategies, etc. The current key issues in relation to the subject are outlined and the strengths and weaknesses of existing life extension decision-making tools are highlighted. This review contains an exhaustive list of scientific references on the topic, including articles published in journals, industry magazines, books and conference proceedings, university dissertations, technical reports and government documents. The proposed literature classification and analysis can help asset owners, asset managers, service providers, stakeholders, public policy-makers, environment protection authorities, and regulatory bodies gain valuable insights on asset life extension decision-making procedures and methodologies.

Keywords

Asset life extension, Safety critical system, Remaining useful life, Condition assessment, Maintenance.