عنوان مقاله:

Presenting a New Hybrid Model of MCDM Methods in Selecting the Best Material of Sleepers in Railway

نویسندگان:

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خلاصه مقاله:

Railway sleepers are one of the most important elements of the railway track system. They are the beams/ties laid underneath the rails to support the track. Their function is to transfer and distribute the transported rail loads to the ballast, transversely secure the rails to maintain the correct gauge-width and to resist the cutting and abrading actions of the bearing plates and the ballast material. Sleepers also resist the lateral and the longitudinal movement of the rail system. Several investigations have been carried out in an attempt to investigate the most durable, the strongest and the most cost effective material for replacing deteriorated and damaged timber sleepers. Some of these approaches attempted to optimize the use of the already existing materials for sleepers such as plantation timber, steel and pre-stressed concrete. Another approach was to use fibre composites as reinforcement for existing railway sleepers. Other approaches focused on the replacement of deteriorated timber sleepers using alternative materials such as polymer concrete, reinforced plastics, rubber and fibre composite material. The purpose of this research is to identify important criteria in optimal using the national assets in railway industry by suitable selecting materials of sleepers and after that, evaluating alternatives to select the best alternative for this important matter. Therefore this study has been used SWARA to identify more effective criteria and evaluate them in this area. Meanwhile VIKOR applied for evaluating alternatives and ranking them. This new methodology that based on SWARA and VIKOR can be useful as a new framework for important issue that need decision making with high attention. So in this research to consider more effective indicators we have used SWARA as one of the most versatile MCDM methods for managerial decision making and complex situations for complex terms with multiple and various measures. In this study, 20 experts participated from different fields participated. The model of research established based on expert ideas and criteria are included: Important criteria were: Useful for heavy loads and high speeds (C1), Useful life (C2), Suitable for truck-circuiting (C3), Suitable for any section of rail (C4), Handling easily without any damage (C5), Damaging in case of derailment (C6), Initial cost (C7), Temperature and fire resistance (C8), Creep resistance (C9), Maintenance cost (C10), Lateral stability (C11), Scrap value (C12) and Moisture resistance (C13). SWARA method applied for evaluating criteria and meanwhile VIKOR method a ...

کلمات کلیدی:

materials of sleepers, railway, SWARA, VIKOR

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