威布尔型多不可修部件备件需求确定方法

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Determination method of the spare demand for multiple components with Weibull distribution

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摘要 针对Weibull型多不可修部件的备件需求确定问题, 提出一种基于Monte-Carlo模拟的方法, 能够较为方便地得到结果, 该方法同样也适用于其它几种分布类型备件量的确定. 在此基础上, 又研究了工程应用中利用指数方法确定Weibull型备件需求量的适应性问题. 从理论上证明了利用指数方法近似计算单部件的备件量具有保守性, 并通过实例计算表明指数方法确定多部件备件量也具有保守性. 简要分析了保守的程度与保障时间、 保障度、部件数量以及Weibull形状参数的关系. 最后给出指数方法的应用时机.

关键词: Weibull型多不可修部件   备件需求   Monte-Carlo模拟   指数方法

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Abstract: As to the spare demand of the multiple irrepairable components of the Weibull type, the method of Monte-Carlo simulation is employed to compute the demand of spare conveniently. This method is also applicable to the types of spare with other distributions. Furthermore, the adaptability that using the exponential method to acquire the spare demand of Weibull type in engineering application is studied. By reasoning, the result indicates the conservativeness of the exponential method to calculate the spare demand for the single component approximately. The practical example also shows the conservativeness of the exponential method in the condition of multiple components. The extent of conservativeness is mainly related to the supporting time, supporting grade, component number and the shape parameter of the distribution through brief analysis. Finally, the application occasion of the exponential method is presented.

Key words: multiple irrepairable components of the Weibull type   spare demand   Monte-Carlo simulation   exponential method

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