Scopus

$\mathbb{Q}$

Back

CORRECTIVE MAINTENANCE TIME MODEL OF THE 2-PARALLEL CONFIGURATION OF THE EARTH STATION SYSTEM USING CURVE FITTING

Kamaruddin, Nur Fatin Syamimi [a] ; Rahim, Nadirah Abdul [a] ✉ ; Mansor, Mahayaudin M. [b] ✉

[a] Department of Electrical and Computer Engineering, International Islamic University Malaysia, Jalan Gombak, Kuala Lumpur, Malaysia

Show all information

0

Citations 🔔

Full text ⌄   Export ⌄   🔖 Save to list

Document   Impact   Cited by (0)   References (14)   Similar documents

Abstract

An Earth station system serves as a key hub in the ever-changing environment of satellite communication technology, allowing uninterrupted data interchange between the Earth and orbiting satellites. These systems are essential for various applications like telecommunications, remote sensing, and global positioning. In this research, a 2-parallel configuration is chosen for the Earth station system design because the literature suggests that it has the lowest operational cost and is reliably acceptable if compared to other parallel configurations. However, the 2-parallel configuration comes with the issue of care and upkeep, especially in the context of corrective maintenance time, which is the aim of this study. Corrective maintenance, or repairing components and systems after failure, is critical to the Earth station system operation. This study uses curve

fitting techniques by using the Monte Carlo method from MATLAB software to foresee system component failures and predict their behavior over time. The useful insights can be extracted from previous maintenance data by using curve fitting, allowing one to make informed decisions regarding when and how to do maintenance. The results demonstrate the curve fitting of the combination of the corrective maintenance for seven subsystems with the mean time between failures (MTBF) of 1, 3, 5, 7, and 10 years, and it is shown that the first-degree polynomial has the lowest Root Mean Square Error (RMSE), which is 1.35. Furthermore, the corrective maintenance time model is developed not only to analyse component failures but also to assist in deriving appropriate maintenance guidelines in the future that can help system engineers repair the failed subsystem. © 2024 Computers and Industrial Engineering. All rights reserved.

Author keywords

2-Parallel Configuration; Corrective Maintenance Time; Curve Fitting; MATLAB; Monte Carlo

Indexed keywords

Engineering controlled terms

Corrective maintenance; Fits and tolerances; Global positioning system; Orbits; Satellite communication systems; Satellite ground stations; Tropics

Engineering uncontrolled terms

2-parallel configuration; Component failures; Corrective maintenance; Corrective maintenance time; Curves fittings; Earth stations; Maintenance time; Monte carlo; Parallel configuration; Time modeling

Engineering main heading

MATLAB

Funding details

Details about financial support for research, including funding sources and grant numbers as provided in academic publications.