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电力系统

计及维修因素的牵引变电站电气主接线可靠性分析

丁雪成，胡海涛，何正友，于敏

西南交通大学，四川省 成都市 610031

摘要：

牵引变电站的可靠性直接关系到铁路运输安全，其电气主接线的可靠性是牵引变电站可靠性研究的重要内容。为此建立了牵引变电站电气主接线在不可维修和可维修情况下的2种可靠性模型，给出了2种不同模型下的平均无故障工作时间(TMTBF)和平均首次故障前工作时间(TMTTFF)的计算方法。计算结果表明：牵引变电站电气主接线可维修时，TMTBF始终大于TMTTFF；可维修时的TMTBF始终大于不可维修时的TMTTFF；可维修与不可维修2种情况下的TMTBF大小取决于部件维修率。

关键词： 牵引变电站 可靠性分析 平均无故障工作时间 平均首次故障前工作时间 维修

Analysis on Reliability of Main Connection of Traction Substation Considering Influence of Maintenance

DING Xuecheng, HU Haitao, HE Zhengyou, YU Min

Southwest Jiaotong University, Chengdu 610031, Sichuan Province, China

Abstract:

Reliability of traction substations directly relates to the security of railway transportation, and maintenance is one of important factors influencing reliability of traction substations. To analyze the influence of maintenance on reliability of traction substation, two reliability models for traction substation are built under un-maintainable and maintainable conditions respectively, and the methods to calculate the mean time between failures (MTBF) and mean time to first failure (MTTFF) of the two proposed models are given. Calculation results show that the MTBF of maintainable main connection of traction substation is evermore greater than its MTTFF; the MTBF of maintainable main connection of traction substation is evermore greater than its MTTFF under un-maintainable condition; the comparison results between the MTBF under maintainable condition and the MTBF under un-maintainable condition depend on the value of component maintenance rates.

Keywords: traction substation reliability analysis mean time between failures (MTBF) mean time to first failure (MTTFF) maintenance

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通讯作者: 丁雪成

作者简介:

作者Email: dxc717@163.com

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