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Experience Generalisation in Ensuring Failure-Free Operation for Onboard Equipment of Command Radio Links

N.N. Bulgakov, *contact@spacecorp.ru*
Joint Stock Company "Special research bureau of Moscow power engineering institute", Moscow, Russian Federation
S.V. Avramenko, *Cand. Sci. (Engineering), contact@spacecorp.ru*
Joint Stock Company "Russian Space Systems", Moscow, Russian Federation
V.F. Zinchenko, *Dr. Sci. (Physics and Mathematics), contact@spacecorp.ru*
Joint Stock Company "Russian Space Systems", Moscow, Russian Federation
A.S. Semochkin, *contact@spacecorp.ru*
Joint Stock Company "Russian Space Systems", Moscow, Russian Federation

Abstract. The paper summarises the experience of the efforts carried out in Joint Stock Company "Russian Space Systems" during 2005-2021 on the development of the onboard equipment for command radio lines for spacecraft of various purposes with a given probability of failure-free operation at different periods of the active service life. The necessity of considering the influence of both radiation factors of space ionising radiation and non-radiation factors on the onboard equipment reliability when estimating the probability of failure-free operation is noted. Various schemes of redundancy of critical nodes for onboard equipment as well as methods of taking into account the influence of ionising radiation on the onboard equipment reliability are considered.
Keywords: reliability, failure rate, redundancy, onboard equipment, ionizing radiation
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