

Quality assurance report

Energy Division – Energy Products & Equipments

Mean Time To Failure (MTTF) Of Medium Voltage SF Circuit Breaker

Terms

In the present state of our knowledge, we can estimate the MTTF of the SF Circuit Breaker based on feedback of critical defects detected on our customers installed base since 2007. We make the hypothesis that the failure rate is constant during all the useful life time of products.

Formulas

An estimator of the failure rate is:

$$\text{Failure rate} = \frac{\text{Number of failures}}{\text{Total time under operation}} \quad (\text{in hour}^{-1})$$

As this failure rate is considered as constant in time, we can calculate:

$$\text{MTTF} = \frac{1}{\text{Failure rate}}$$

Moreover, as the Mean Down Time (MDT) is negligible in comparison to the Mean Up Time (MUT), the Mean Time Between Failures (MTBF) is equal to the MTTF.

Result

According to the total number of installed products since 2007 (more than 250000), and considering the major and critical defects (during operation) on the period 2007-2016:

- The operational **failure rate** is estimated **1.96 x 10⁻⁸ hour⁻¹**.
- The corresponding **MTTF is 5824 years**.

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