

Safety function

TYPES OF HARDWARE FAILURE



FAILURES

RANDOM FAILURES

SYSTEMATIC FAILURES

COMMON CAUSE FAILURES

SAFE FAILURES

DANGEROUS FAILURES

NO EFFECT FAILURES

NO PART FAILURES

HARDWARE FAILURES

Mainly Random Failures

DETECTED FAILURES

UNDETECTED FAILURES

DETECTED FAILURES

UNDETECTED FAILURES

MAIN TYPES OF HW FAILURE

SAFE FAILURES

- Example

Leaks due to leakage defects.

DANGEROUS FAILURES

- Example

Stick-slip effect due to tightness. Opening more than 1 second.

NO EFFECT FAILURES

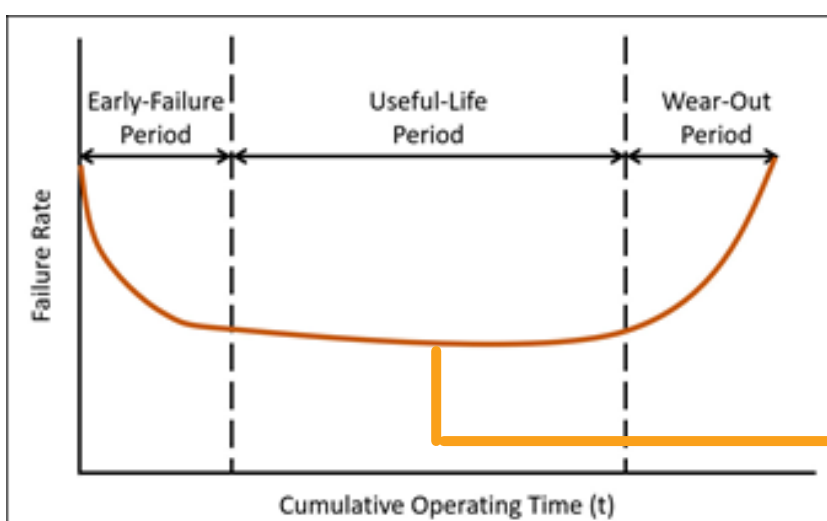
- Example

Intact in the spring, which has no effect on the safety function.

NO PART FAILURES

- Example

Bleed valve position indicator.



The failure rate $\lambda(t)$ at time t is defined by the number of faults during Δt in relation to the number of operating components at time t .

$$\lambda(t) = \lambda$$