Mean Time Between Failure (MTBF)

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Mean Time Between Failure (MTBF) depends upon the maintenance philosophy. MTBF is the predicted elapsed time between inherent failures of a mechanical or electronic system, during normal system operation. MTBF can be calculated as the arithmetic mean (average) time between failures of a system. The term is used for repairable systems, while Mean Time To Failure (MTTF) denotes the expected time to failure for a non-repairable system.[1)]

If a system is designed with both redundancy and automatic fault bypass, then MTBF is the anticipated lifespan of the system if these features cover all possible failure modes (infinity for all practical purposes). Such systems will continue without noticeable interruption when these conditions are satisfied unless there are secondary failures. This is called active redundancy, which requires no maintenance to prevent mission failure. Active redundancy is required for systems that cannot be maintained, such as satellites.

If a system has no redundancy, then MTBF is the inverse of failure rate, λ .

Systems with spare parts that are energized but that lack automatic fault bypass are not actually redundant because human action is required to restore operation after every failure. This depends upon Condition-based maintenance and Planned Maintenance System support

Source: Mean Time Between Failure (MTBF)

1)
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