Juran's Mean Time Between Failure (MTBF)

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Purpose

Rough calculation of the Mean Time Between Failure (MTBF) based on historical data. This tool is to be used at a customers request. MTBF is not "operating life" or "service life".

Source

Juran's Quality Control Handbook 4th Edition. The MTBF estimate is based on $R = e^{(-t/u)}$ where R is the probability of failure-free operation for a time period equal to or greater than t, e is 2.718..., t is a specific period of failure-free operation, and u is the Mean Time Between Failure. When solving for MTBF, you get :

$u = -t / Ln(1 - R)$

Assumptions

1. "All RMA's" / "All Shipments" for a large enough time period is the 'Failure Rate'
2. 'Failure Rate' = 1 - R   (R as defined in the 'Source' Section)
3. The 'Failure Rate' is constant
4. All Failures are repaired and placed back into the customer system
5. The time, or 't' is based on the table below. The table assumes a 40 hr. work week, 50 weeks a year. The most recent year of operation will only count for 6 months of operation time. The table is based on cumulative hours

MTBF   (hours)

AKD-x00306 MV3	AKD-x00606 MV6	AKD-x01206 MV12	AKD-xP02406 MV24	AKD-x00307 HV3	AKD-x00607 HV6	AKD-x01207 HV12	AKD-x02407 HV24
2,354,036	2,308,037	1,424,368	724,928	1,763,822	1,720,059	2,014,113	1,142,601

AKM1	AKM2	AKM3	AKM4	AKM5	AKM6	AKM7
3,429,303	763,604	688,151	1,165,686	4,451,125	1,339,092	1,933,567

AKM E Winding	AKM H Winding	AKM G Winding	AKM C Winding	AKM D Winding	AKM K Winding	AKM L Winding	AKM P Winding
2,282,672	4,726,569	1,579,390	3,503,789	1,389,338	6,737,492	2,138,437	4,014,050

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