Moving Averages & Trend Lines

Additional Comments

MIL-HDBK-189 Figure 5.22

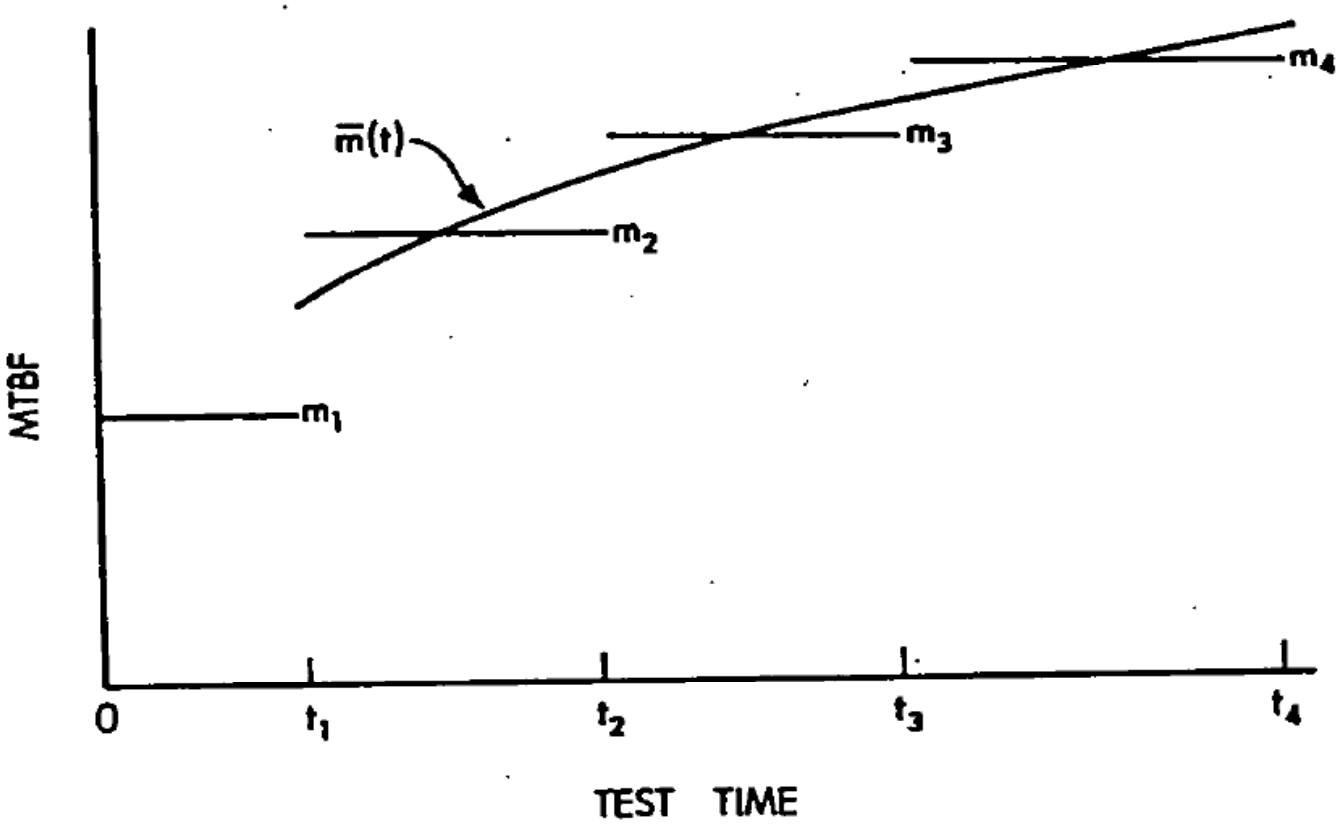

Figure 5.22 Average MTBF's and Modified $\bar{m}(t)$ Curve.

Note: Figure 5.20 is like 5.22 but is for failure rate, not MTBF

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13 February 1981

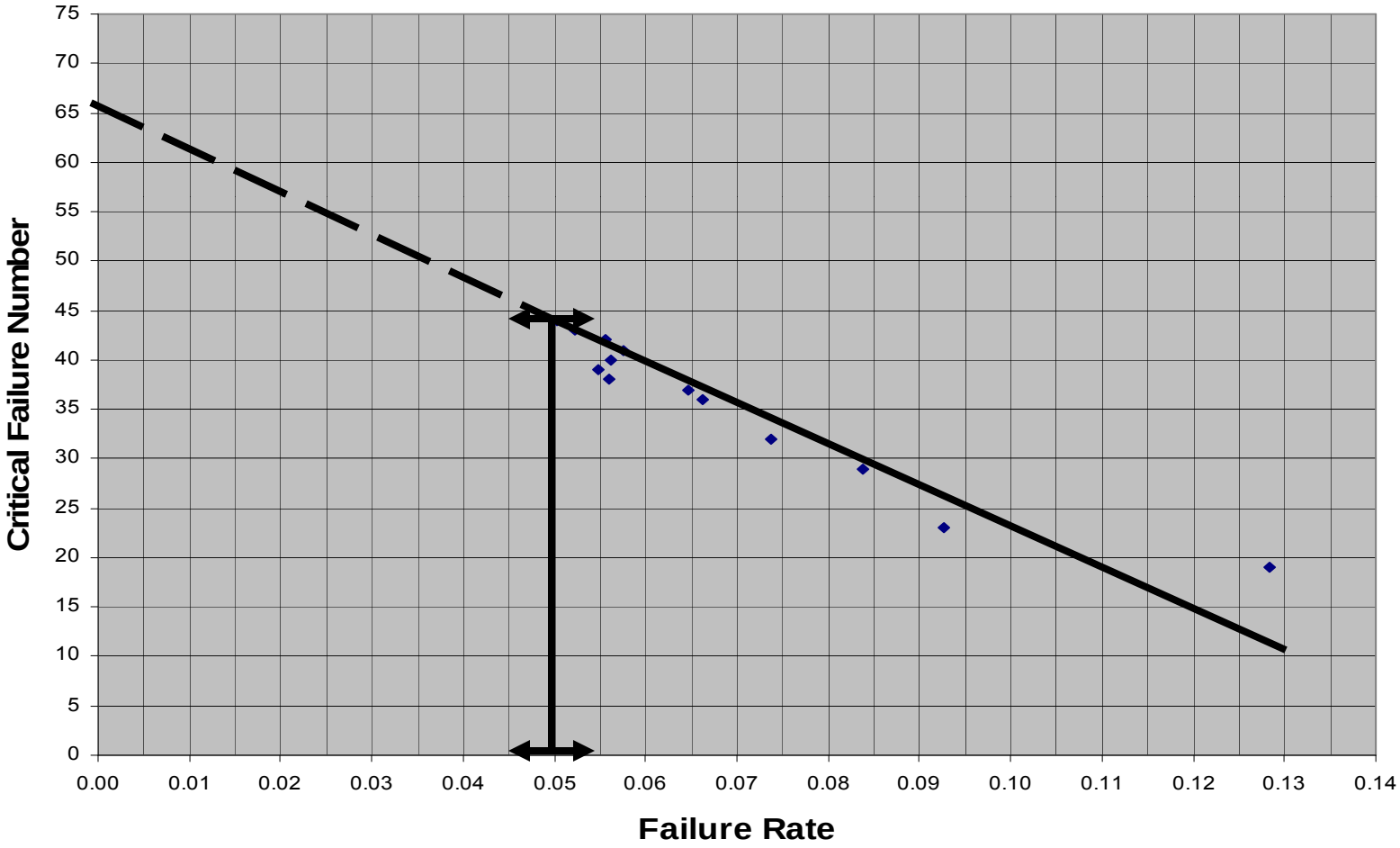
TEST TIME

Figure 5.20 Average Failure Rates and r(t) Curve.

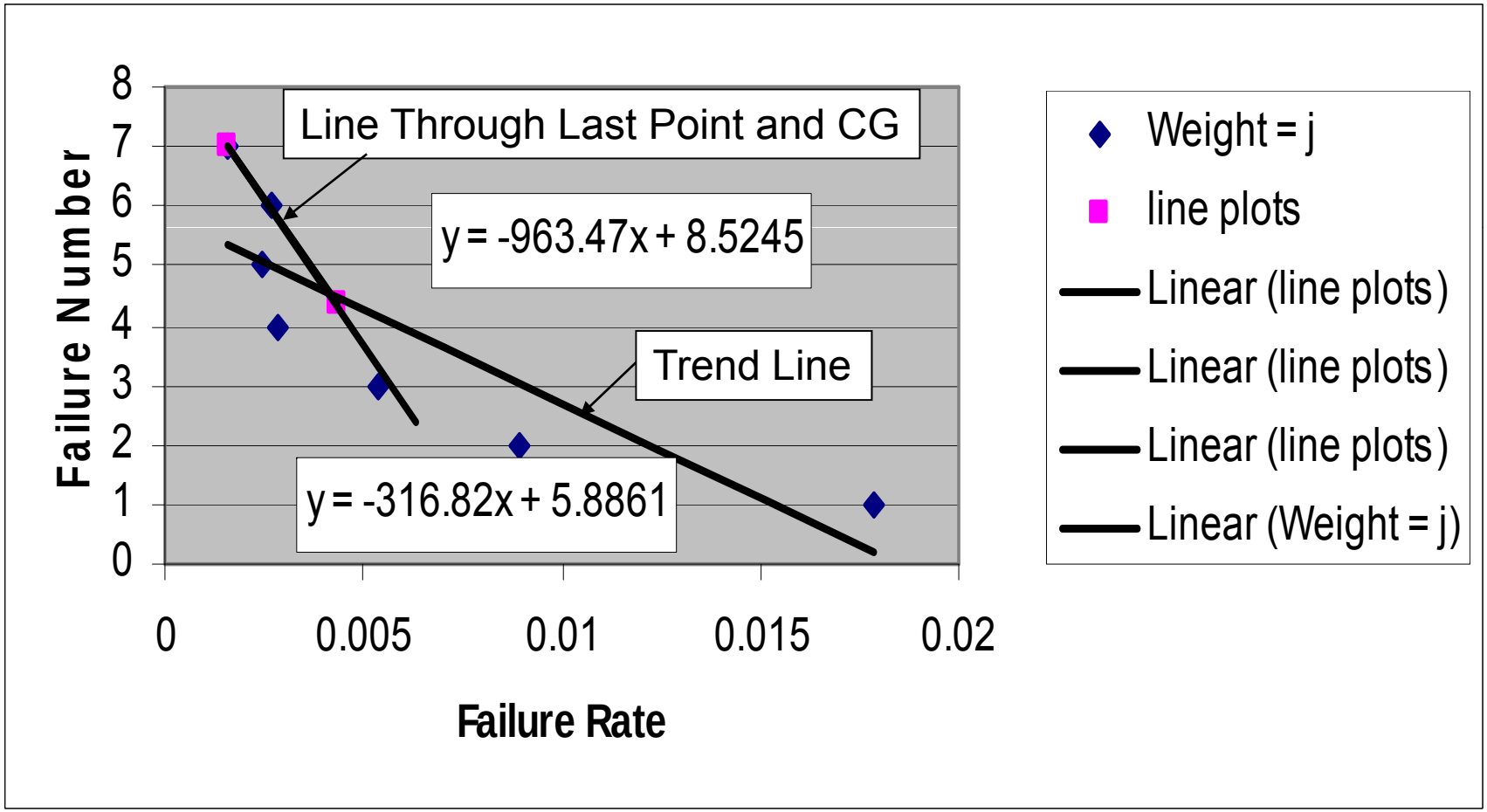
For any test phase the area under the curve r(t) is equal to the area under the average failure rate. Therefore, for any test phase the average failure rate can be determined from r(t). The reciprocal of the curve r(t), $m(t) = (r(t))^{-1} = M_I^{(t/t1)\alpha} (1-\alpha)^{-1}$ also crosses the average MTBF m_i for each test phase. See Figure 5.21.

The actual underlying pattern for reliability growth is represented by the increase in the test phase average MTBF's. The growth in the individual test phase does not follow the smooth line m(t). In particular, note that the curve m(t) gives a value of 0 at test time 0, which is, of course, not a realistic value for the actual system MTBF at the beginning of development testing. However, the curve m(t) can generally be viewed as reflecting a meaningful trend for the average MTBF's after the first teat phase. See Figure 5.22.

Point Estimates vs Failure Intensity for Software



Use of a Trend Line for this SW Reliability Data Would Conclude that Total Errors<Number Already Observed!



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