



ASQ CRE Prep course

Lesson V. B. 3.

Reliability Growth Testing

TAAF

- **Test, Analyze, and Fix Method**
- **Failure analysis**
- **Corrective Action**



Duane Model

- **Test planning**
- **Given current situation and desired priority**
- **Also, can model reliability growth**

$$\frac{\theta_c}{\theta_o} = \left(\frac{T}{T_o} \right)^\alpha$$

$$\ln \theta_c = \ln \theta_o + \alpha (\ln T - \ln T_o)$$

Alpha values

0.4 – 0.6 top priority

0.3 - 0.4 above average

0.2 – 0.3 routine

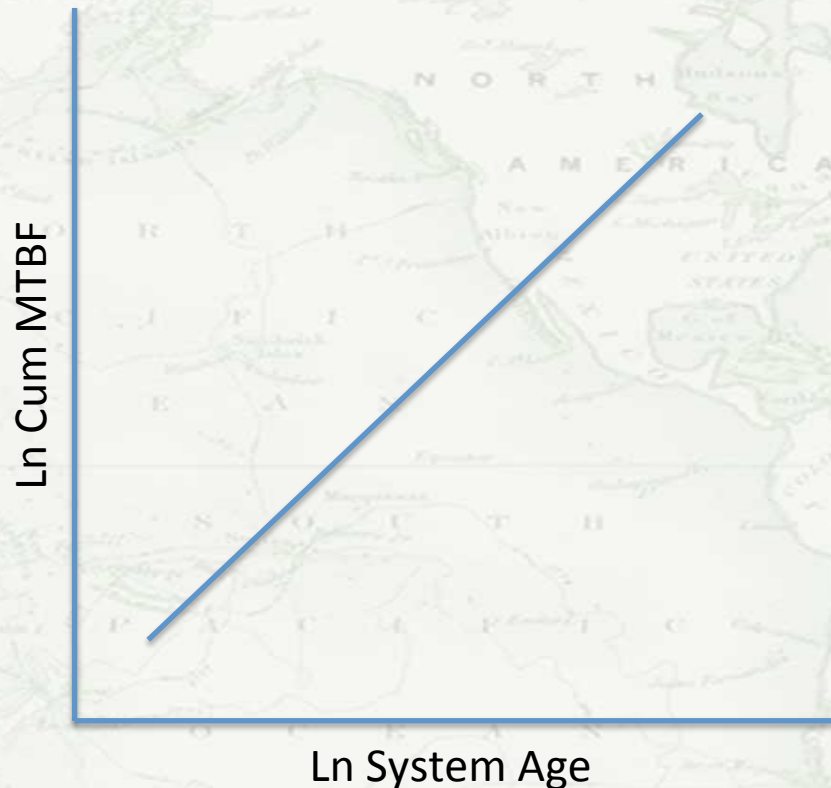
0 – 0.2 low priority

Duane Model Example

**Straight line indicates
NHPP Power Law Model**

$$T / [r(1 - \beta)]$$

**Curvature may indicate a
different model**



AMSAA Model

- **Uses Weibull**
- **Within a Test Phase
not across phases**
- **Continuous scale**

$$N(t) = \left(\frac{t}{\alpha} \right)^{\beta}$$
$$\ln[N(t)] = \beta \ln(t) - \beta \ln(\alpha)$$

Mean Cumulative Function

- **Recurrent data (repaired systems)**
- **Plot cumulative failures over time**
- **Regression provides a model**



A historical map of the Pacific Ocean, likely from an 18th-century publication. The map shows the Pacific Ocean as a vast body of water, with the Americas on the right and Asia on the left. The Pacific is labeled 'PACIFIC OCEAN' in large letters. The Americas are labeled 'NORTH AMERICA' and 'SOUTH AMERICA'. Asia is labeled 'ASIA' and 'MONGOLIA'. Australia is labeled 'NEW HOLLAND (AUSTRALIA)'. The map also shows the 'SOUTH PACIFIC' and 'NORTH PACIFIC' regions. The map is oriented with North at the top. The map is a detailed representation of the Pacific Ocean and its surrounding landmasses, showing the progress of exploration and discovery at the time. The map is a historical document that provides a visual representation of the world as it was known in the late 18th century. The map is a valuable resource for historians and geographers, as it provides a visual representation of the world as it was known at the time. The map is a historical document that provides a visual representation of the world as it was known in the late 18th century. The map is a valuable resource for historians and geographers, as it provides a visual representation of the world as it was known at the time.

Which Plots and
Models are most
useful?



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Lesson V. B. 4.

Software Testing