ASQ CRE Prep course

Lesson IV. B. 1.

Parts Count Predictions and Parts Stress Analysis

Polish that crystal ball

TALLY UP THE FAILURE RATES

Parts Count Prediction

Based on historical failure data

Baseline failure rates

Modified by estimated factors

Mil Hdbk 217 is an example

Assumes series system model

$$\lambda_{sys} = \lambda_1 + \lambda_2 + \cdots + \lambda_n$$

$$\lambda_{sys} = \lambda_1 \pi_{Q1} + \lambda_2 \pi_{Q2} + \cdots + \lambda_n \pi_{Qn}$$

Part Stress Analysis

Start with Part Count method

Add Stress factor

$$\lambda_{sys} = \lambda_1 + \lambda_2 + \cdots + \lambda_n$$

$$\lambda_{sys} = \lambda_1 \pi_{Q1} + \lambda_2 \pi_{Q2} + \cdots + \lambda_n \pi_{Qn}$$

$$\lambda_{sys} = \lambda_1 \pi_{Q1} \pi_{e1} + \lambda_2 \pi_{Q2} \pi_{e2} + \cdots + \lambda_n \pi_{Qn} \pi_{en}$$

When would this be useful?

To ID and Predict safety issues
To Predict and Quality warranty
To determine estimate unit life
To ID weakest elements

NOTE: These approaches are very, very inaccurate. In practice do not use unless you have very good data to support the model

In practice,
it's not accurate

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Lesson IV. B. 2. a.

Reliability Prediction Methods Considerations