



ASQ CRE Prep course

Lesson IV. B. 1.

Parts Count Predictions and
Parts Stress Analysis

A photograph of a bright orange plastic pot filled with snow. Several thin, dark, bare branches with small, dark buds or leaves are sticking out of the snow. The background is a clear, light blue sky. The overall mood is cold and wintry.

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

$$\lambda_{\text{sys}} = \lambda_1 + \lambda_2 + \dots + \lambda_n$$

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

Part Stress Analysis

Start with Part Count method

Add Stress factor

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

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

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

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