

Reliability Growth and Repairable System Data Analysis

This course will address state of the art methods for planning and evaluating the reliability of complex systems during three key life cycle phases: design, development testing and customer field use. Areas covered include failure mode management strategy, the Crow (AMSAA) model and the Crow Projection model for managing reliability growth in development and Crow Power Law model for assessing the reliability of repairable systems. Course handouts include a course manual and RAC's publication "Reliability Toolkit: Commercial Practices Edition."

Course Instructor

Dr. Larry Crow is the Chief Scientist of Alion Science and Technology Industrial Operation. Prior to joining Alion he was the Technical Manager for Reliability and Quality Assurance, General Dynamics, Advanced Technology Division and chief of the Reliability Methodology Office at the US Army Material System Analysis Activity (AMSAA). He developed the Crow (AMSAA) reliability growth model that has been incorporated into US DoD military handbooks and international standards. He chaired the tri-service committee to develop MIL-HDBK-189, Reliability Growth Management and is the principal author of the document. He received the 1976 Army Material Development and Readiness Command Systems Award for Individual Achievement. From 1979-1985, Dr. Crow chaired the US, UK, Canadian, and Australian reliability group of the Technical Cooperation Program (TCP) and is a US delegate on reliability and maintainability to the International Electromechanical Commission (IEC). Dr. Crow is an elected Fellow of the American Statistical Association and the Institute of Environmental Sciences.

Course Contents

Reliability Growth Management and Planning

1. Reliability Management Strategy in Design and Testing
2. Developing Idealized Growth Curves
3. Developing Planned Growth Curves
4. Estimating the Initial Reliability in Growth Testing
5. Estimating the Growth Potential
6. Reliability Growth Fix Effectiveness Factors
7. Managing Reliability Using Type A and Type B Failure Mode Methodology

Reliability Growth Analysis and Implementation

1. Duane Reliability Growth Postulate
2. Crow (AMSAA) Reliability Growth Tracking Model
3. Reliability Growth Confidence Intervals
4. Reliability Growth Goodness of Fit Tests
5. Reliability Growth Estimation with Missing Data
6. Reliability Growth Estimation with Failure Times Unknown
7. Crow One Shot Reliability Growth Model
8. Crow Reliability Growth Projection Model
9. Estimating Reliability Growth Maturity

Repairable System Analysis

1. Evaluating the Reliability of Fielded, Repairable Systems Using Crow Power Law Model
2. Mission Reliability for Fielded, Repairable Systems Using Crow Power Law Model
3. Warranty Analysis Methods for Fielded, Repairable Systems
4. Replacement and Overhaul Analysis Methods for Fielded, Repairable Systems
5. Reliability Confidence Intervals for Fielded, Repairable Systems