

Lifetime Data analysis (LDA) & Reliability Growth analysis (RGA) for repairable and non-repairable equipment:

How to prepare a failure historical database to predict reliability and future numbers of failures

WHY SHOULD ATTEND THIS TRAINING:

- To understand the LDA methodology concept as basic of reliability engineering assessment.
- To understand the reliability, failure rate MTTF, MTBF, MTTR concepts.
- To understand the probability density functions such as exponential, lognormal, logistic, loglogistic, Weibull, Normal, Gumbel, Gama, others.
- To understand the goodness of fit test such as Plot method, Regression, likelihood, Chi-square, Komogorov Smirnov and Cramer von mises.
- To understand different specialist elicitation methods.
- To understand how to build up an equipment failure and repair database.
- To understand how to collect data from databases to perform LDA.
- To understand how to predict the reliability index
- To understand how to predict the expected number of failures, intensity failures, MTBF tendency based on RGA model for repairable and non-repairable equipment.

WHO SHOULD ATTEND THIS TRAINING:

The following selected participants should attend this course:

- Asset Managers, Maintenance Managers, Production Managers, HSE Managers, Project managers.
- Safety Engineers, Reliability Engineer/Maintenance Engineer/ Supervisor, Risk management specialist
- Rotating Engineer/ Static Engineer/Supervisor
- Design Engineer/Production Engineer/
- Everybody who wants to broaden knowledge and interest in this topics

TRAINING MATERIAL OUTLINE

- 1. Reliability concepts (2 h)**
 - Statistics concepts;
 - Reliability concepts;
 - Failure rate Concept;
 - MTBF, MTTF and MTTR concepts;
 - Specialist elicitation methods;
- 2. Historical failure and repair database (2h)**
 - Type of data;
 - Different historical data levels;
 - How to build up an equipment database;
 - How to collect data from databases to perform LDA;
 - RCA analysis;
 - FRACAS.
- 3. Probability Density Functions (3 h)**
 - Exponential;
 - Normal;
 - Logistic;
 - Lognormal;
 - Loglogistic;
 - Gumbel;
 - Weibull;
 - Gama.
- 4. Goodness of Fit test (2 h) RGA for repairable systems**
 - Plot method;
 - Regression Method;
 - Likelihood method;
 - Chi-square method;
 - Smirnov Komogorov;
 - Cramer Von Mises.
- 5. Reliability Growth Analysis model for repairable and non-repairable systems (2h)**
 - RGA concept;
 - Expected number of failure prediction;
 - Next time to failure prediction;
 - Intensity function prediction;
 - MTBF tendency prediction.
- 6. LDA and RGA application cases (5 h)**
 - Pumps LDA and RGA;
 - Compressors LDA and RGA;
 - Heat Exchanger LDA and RGA;
 - Valves LDA and RGA;
 - Sensor LDA and RGA;
 - Pipes LDA and RGA;
 - Furnace LDA and RGA.



Dr Eduardo Calixto

Doctorate in Energy and Environment focus on risk management, Master Degree in Safety Management, Bachelor in Industrial Engineer and a wide range of reliability, risk analysis and safety techniques across a range of industries like Oil and Gas (including onshore, offshore, subsea, utilities and drill facilities), Metallurgic, Aerospace & Defense and Railway Industry. Dr. Eduardo Calixto is Certified Reliability Professional (CRP) by Reliasoft Corporation US and Certified Functional Safety Expert (CFSE) by Exida US.

Key experiences include 17 years dedicating to reliability engineer studies and Risk management assessment. A total of 12 years dedicating to Oil and gas working 8 years by Petrobras S.A in Brazil, 2 year by Reliasoft Corporation as Reliability Consultant mostly dedicated to Kuwait Oil Company projects and 2 years by Genesis Oil and Gas consultant Company in London, as Principal Reliability Engineer, which support different major Oil and Gas company projects all over the world. In addition, Dr. Eduardo had 2 years dedicated to Metallurgic Industry by Vale in Brazil, 1 year dedicated to Aerospace project in Germany and 2 year dedicated to the transportation industry in projects in Germany, Austria and UK by Bombardier Transportation and Molinari Railway as RAMS expert.

