EDUARDO CALIXTO
CONSULTANT

Training Program	:	**LIFE TIME DATA ANALYSIS FOR PROCESS INDUSTRY**
Discipline	:	**RELIABILITY, MAINTENANCE & SAFETY ENGINEERING**
System	:	**PROCESS PLANTS**
Equipment	:	**Pump, Compressors, Valves, Pipelines, Heat exchangers, others**
Training Focus	:	**Historical failure data base, statistic concepts, probability density function parameter estimation, reliability prediction, failure rate prediction, MTTF and MTTR prediction, CROW AMSSA model applied to repairable and non-repairable equipment.**
Lesson Code	:	**105**
Lesson Title	:	**Historical failure data base, statistic concepts, different probability density function parameter estimation, reliability prediction, failure rate prediction, MTTF and MTTR prediction, CROW AMSA model applied to repairable and non-repairable equipment.**

Training Elements :

Historical failure data base,
Statistic concepts,
Different Probability density function parameters estimation,
Reliability prediction,
Failure rate prediction,
MTTF and MTTR prediction,
CROW AMSA model applied to repairable and non- repairable equipment.

Training Objectives:

- 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

Day 1:

Subject	Activity	Time	Resources
Module 1 - Introduction (Welcome for participants and scope of training)	Theoretical	30 min	Forms & PPT
Module 2 - Statistic concept	Theoretical	60 min	PPT
Module 3 - Reliability Concepts	Theoretical	30 min	PPT
Module 4 - LDA Methodology	Theoretical	60 min	PPT
Module 5 - Goodness of Fit test (Plot method, Regression Method, Likelihood method, Chi-square method, Smirnov Komolgorov, Cramer Von Mises)	Theoretical	60 min	PPT
Lunch Break: 12:30 – 14:00 hrs.			
Module 6 - **Probability Density Functions** (Exponential, Normal, Logistic, Lognormal, Loglogistic, Gumbel, Weibull, Gama, Others)	Theoretical	60 min	PPT
Module 7 - Probabilistic Degradation Analysis (PDA)	Theoretical	60 min	PPT
Module 8 - Accelerated test data analysis Model (QALT)	Theoretical	60 min	PPT
Module 9 - Reliability Growth data analysis (RGA)	Theoretical	60 min	PPT
Module 10 – Generic Reliability Database	Theoretical	30 min	PPT

Day 2:

Subject	Activity	Time	Resources
Module 11 -. FRACAS Concepts	Practical	60 min	Software
Module 12 – FRACAS online application case	Practical	60 min	Software
Module 13 - Pumps LDA and RGA case.	Practical	60 min	Software
Module 14 - Compressors LDA and RGA case	Practical	60 min	Software
Lunch Break: 12:30 – 14:00 hrs.			
Module 15 - Heat Exchanger LDA and RGA case	Practical	60 min	Software
Module 16 - Valves LDA and RGA case	Practical	60 min	Software
Module 17 – Tank PDA case	Practical	60 min	Software
Module 18 - Pipe PDA case	Practical	60 min	Software