



TRAINING PROGRAM ON

Reliability Concept Introduction



ABOUT ARRELIC TRAINING INSTITUTE

Arrelic Institute is focused to equip both industry professionals and college graduates with the skills and knowledge required for bridging the desire state of workforce which industry needs to compete globally.

Arrelic Institute provides over 75 different type of customized training programs in the field of Reliability Engineering, Asset Management, Best Practice, Operation & Maintenance, Predictive Maintenance, NDT, Predictive Analytics, Quality, Risk & Safety.

Arrelic Institute conducts public trainings and workshops in 38 locations across India and 10+ International locations. We are working for large corporate house from 15 different types of industries ranging from Airlines, Automobiles, Cement, Defence Manufacturing, FMCG, Glass, Marine, Metals, Mining, Oil & Gas, Power, Pulp & Paper, Facility Management and Fertilizer.

ARRELIC INSTITUTE: AT A GLANCE



www.arrelic.com/offerings/training-and-development

ARRELIC AWARDS & RECOGNITIONS

NASSCOM[®]

TOP5

Won the Top 5 Startups in eastern India in Thieve 30 by NASSCOM



GLOBAL ENTREPRENEURSHIP SUMMIT
INDIA 2017

Selected for GES – 2017, Hyderabad and showcased among top 100 Start-ups from India.



SMART FIFTY
50 Solutions to Transform India

TOP50

Emerged as one of the top 40 startups in #Smartfifty' – a search for solutions to transform India



Top 24 Start-ups selected over 1850 startups across India By CNBC.



Selected for NPC – Bangalore and NPC – Kolkata for Product showcase.



Product showcased in TIECON – 2017 and selected through Govt. Of Odisha.

#startupindia

Startup India Recognize

Startup Odisha

STARTUP ODISHA recognised.



birac
Ignite Innovate Incubate

BIRAC finalist in SPARCH - 2017

web summit

LISBON, NOVEMBER 6-9, 2017

Selected for Web summit - Lisbon



hello tomorrow

Selected for Hello tomorrow, Paris Summit.



Selected and presented in 1000 open startups.



ABOUT THE TRAINING COURSE

Reliability Concept Introduction

For an Organization without a strong reliability focused maintenance program, minor breakdowns can become financial and operational nightmares. A single piece of equipment fails, and the production process grinds to a halt. Reliability is connected with starting failures of Products or Services and comprehension. Why these failures happen is vital to know in enhancing reliability. Every person has some idea of what Reliability is from their everyday life. One might say that Reliability is quality over time. Quality is connected with workmanship and fabricating and in this way if an item doesn't work or breaks when you get it you would consider the item to have poor quality. Reliability engineering has both quantitative and qualitative perspectives; estimations of unwavering quality are important for client prerequisites consistence requirements compliance.

Reliability engineering deals with the estimation, prevention and management of high levels of "lifetime" engineering uncertainty and risks of failure. Although stochastic parameters define and affect reliability, reliability is not (solely) achieved by mathematics and statistics. One cannot really find a root cause (needed to effectively prevent failures) by only looking at statistics.

Arrelic's Reliability engineering is designed to emphasize dependability in the life cycle management of a product. Dependability or reliability describes the ability of a system or component to function under stated conditions for a specified period of time. Reliability engineering deals with the estimation, prevention and management of high levels of "lifetime" engineering uncertainty and risks of failure. Reliability engineering focuses on costs of failure caused by system downtime, cost of spares, repair equipment, personnel, and cost of warranty claims.



LEARNING OBJECTIVES & KEY BENEFITS OF ATTENDING THE WORKSHOP

By attending this technical training on “Reliability Concept Introduction” delegates will be able learn and deliver the following things.

- ✓ Basics of Reliability Engineering Data Analysis and Modelling.
- ✓ Benchmarks Based Reliability Prediction
- ✓ Effective RCM Series
- ✓ Framework/System Risk and Reliability Analysis Series.
- ✓ Life Data Analysis.
- ✓ Describe basic concepts of reliability engineering
- ✓ List the motivations for reliability and reliability engineering
- ✓ List the various reliability benefits applied to process, design, products and systems
- ✓ Explain different reliability terms and concepts such as MTBF, MTTR and MTTF
- ✓ Discuss differences and similarities between failure rate, reliability, availability and unavailability. Discuss reliability of a repairable Vs a non-repairable system
- ✓ Discuss different reliability predictions models including MIL-217
- ✓ Explain the role of design tools for reliability predictions
- ✓ Describe FMEA, FMECA, Process FMEA, Design FMEA, FTA, RDB, Markov, and Event Tree Analysis (ETA)

WHO SHOULD ATTEND ?

Successful Reliability Concept Introduction programs require the disciplined application of proven processes and interdepartmental partnerships. It is important for departments that are influenced and impacted by the processes to understand the processes. People in the following roles should participate in this training:

- ✓ Engineers
- ✓ Project Engineers
- ✓ Asset Managers
- ✓ Maintenance Engineers
- ✓ Design Engineers
- ✓ Reliability Engineers/Technicians
- ✓ Operators
- ✓ Safety Engineers
- ✓ Risk Engineers
- ✓ Defect Elimination Managers





INDUSTRIES THAT CONCERN ABOUT

LOW PRODUCTIVITY



Conventional use of time-based approach for maintenance does not take into consideration the way assets are being utilized, their current condition and real world operating conditions.

HIGH DOWNTIME



Failure to curb unplanned downtime and lack of control over value chain processes lead to high costs, inefficiencies and poor compliance. These severely impacts the profit and industrial growth.

INADEQUATE ASSESS CONTROL



Industries lack the ability to interpret assets data and because of unavailability of proper predictive methods they are unable to predict equipment failures which leads to unplanned downtime.

HIGH MAINTENANCE COST



Increased competition, pressure to grow revenue & profit, tighter regulations, scarcity of raw material, fluctuation demand and obsolete technologies have impacted the way industries are being operated.

COURSE OUTLINE

DAY - 1

FUNDAMENTAL

- ✓ Introduction to Reliability Concepts
- ✓ Benefits of a Reliability Based Maintenance System
- ✓ Definitions of Terms and Measures in Reliability
- ✓ Reliability Analysis

RELIABILITY METHODS

- ✓ Fundamental RAM mathematics
- ✓ Reliability Engineering Methods
- ✓ Root Cause Analysis
- ✓ Failure Modes & Effects Analysis
- ✓ Failure Mode and Effects Criticality Analysis
- ✓ Fault Tree Analysis
- ✓ Weibull Analysis
- ✓ Reliability Prediction
- ✓ Reliability Centered Maintenance
- ✓ RCM Pitfalls - What Can Go Wrong
- ✓ RCM - What Should Happen

RELIABILITY CONSIDERATION

- ✓ System Availability Analysis
- ✓ Introduction to Capacity Modelling
- ✓ Putting the Computer to Work
- ✓ Lifecycle Cost Calculation & Analysis
- ✓ Enabling the Improvement Loop - Problem Reporting
- ✓ What Tool, When
- ✓ Key Factors for Success
- ✓ Summarising the Business Case

REVIEW & Q/A

DAY - 1

RELIABILITY TOOLS

- ✓ Risk Matrix, Severity calculations, ISO risk Surfaces, TIAM, FMEA,
- ✓ FMECA, Process FMEA, Design FMEA, FTA, RDB, Markov, ETA
- ✓ Mean Time Between Failures (MTBF)
- ✓ MTBF for both repairable and non-repairable, Mean Time To Failure (MTTF), MTTF for non-repairable systems
- ✓ Mean Time To Repair (MTTR)

ADDITIONAL TOOL

- ✓ Reliability and Availability
- ✓ Integrated Asset management - Design 4 Reliability - data flows
- ✓ Cost V/s Benefit - risk optimization
- ✓ Reliability theory Review
- ✓ Probabilistic Reliability Calculations
- ✓ Safety and SIL calculations
- ✓ Fault tolerance
- ✓ RAMS study reliability element introduction
- ✓ Basic Reliability modelling using Probabilistic methods

COURSE REVIEW

- ✓ Learning and developments in the Reliability
- ✓ Tips to Success in Reliability

POST ASSESSMENT

PROGRAM SCHEDULE

09:00 -10:30
10:30 -11:00
11:00 -12:30
12:30 -13:30

Morning Session 1
Refreshments & Networking Break
Morning Session 2
Lunch

13:30 -15:00
15:00 -15:30
15:30 -17:00
17:00 -17:30

Afternoon Session 1
Refreshments & Networking Break
Afternoon Session 2
Day review & Q/A