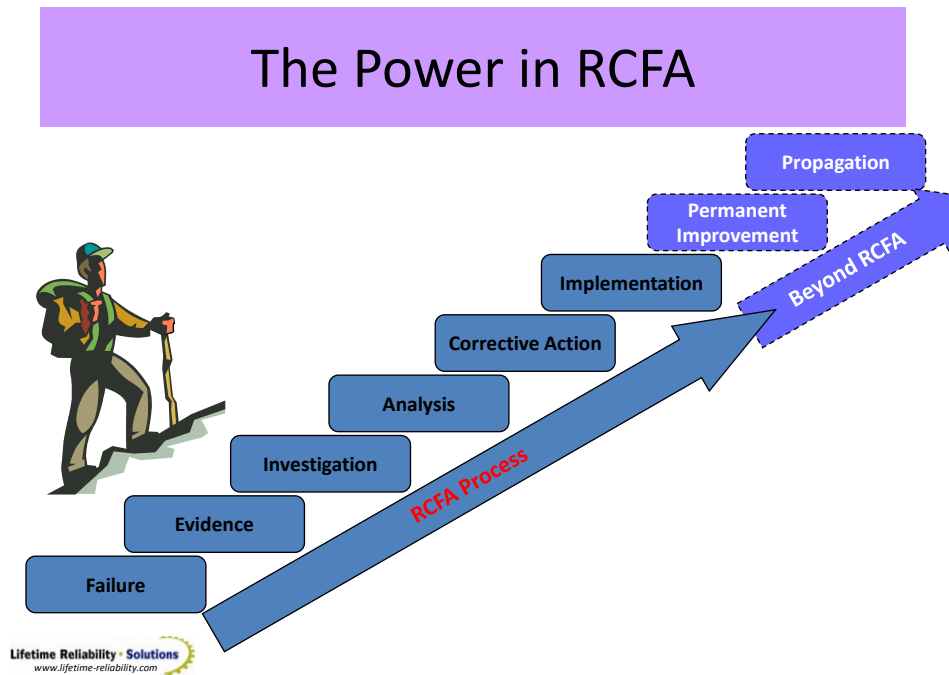


## Root Cause Failure Analysis Training Course Content



### Module 1 – Success with Root Cause Failure Analysis (RCFA)

- **The Purpose and Use of RCFA**
  - Applying RCFA in Operations and Maintenance
  - Establish A Reliability Improvement Process in Your Business Management System
  - Evidence Gathering and Data Analysis
  - *Activity 1* - Study of an RCFA and the RCFA process
- **The True Causes of Failure**
  - Understanding Failure and Error
    - Defect Creation
    - Physics of Failure
    - Human Factors
    - Life Cycle Gaps
    - Hidden Failures
    - Latent Beliefs and Values
    - Common and Special Causes of Failure
- **Production Plant and Equipment Failure**
  - What Reliability Engineering Tells Us about Failure
  - Reliability of Series Processes
    - Machinery
    - Work Activities
    - Production Plants
- **A Range of Root Cause Failure Analysis Tools**
  - Types of Failure Analysis
    - Creative Disassembly
    - 5/7 Whys/RCFA
    - Risk Analysis
  - Collecting Evidence
    - At Failure Site
    - Historical Records
    - Operating Records



- The 7 Quality Control Tools for Data Analysis
- Selecting the Data Analysis Tools
- Shopfloor Level
  - '5 Whys' Method
  - Case Study – 5 Why Example
- Equipment Level
  - *Activity 2* – 'Is-Is Not' Table
  - Failure Modes and Effects Analysis (FMEA)
  - FMEA at System Level and Component Level
  - *Activity 3* – Apply FMEA at Component Level
- Process Level
  - Flow Mapping of the Process
  - Fault Tree Analysis
- **Guided Application of an RCFA**
  - *Activity 4* – Conduct/Review an RCFA into a chemical reactor wall failure and open Discussion

## **Module 2 – Using RCFA to Improve Work Processes, Plant and Equipment Reliability**

- **The RCFA Team and Team Facilitator**
  - Role of the Facilitator
  - Team Dynamics
  - Running the RCFA Meeting
  - Cooperation Techniques
  - Using the Six Hats for New Perspectives
  - Facilitation Technique
- **Making Failure Elimination Part of Normal Business**
  - Review Failure Elimination Process
  - *Activity 5* – Groups of Attendees Do RCFA and develop Failure Elimination Solution
- **Practice a Creative Disassembly**
  - Creative Disassembly
  - Review Creative Disassembly and open discussion
  - *Activity 6* – Groups of Attendees conduct a Creative Disassembly
- **Practice a 5/7 Whys Analysis**
  - Review the 5 Why process and open discussion
  - *Activity 7* – Groups of Attendees conduct longer 5 Why using the full method
- **Taking Reliability Improvements Company-Wide**
  - Permanently Capturing Improvements into Corporate Intelligence
  - Improving Business Processes and Standard Operating Procedures
  - Precision Operating Procedures – Including the ACE 3Ts of Failure Prevention
  - The Importance of Training People to Specific Quality Requirements
  - *Activity 6* – Develop an Accuracy Controlled 3T Procedure
- **Practice an RCFA**
  - Review the RCFA process and open discussion
  - Review Failure Analysis Tools
  - *Activity 8* – Group conducts longer RCFA using the full method