ROOT CAUSE FAILURE ANALYSIS (RCFA)

Asset Performance Improvement
Continuous Risk Reduction
Defect Elimination
Living Program

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THE ALADON RCFA PROCESS OFFERS THE FOLLOWING:

- Two tier approach for managing all equipment failures (tolerable and intolerable risks) and includes the valuable input from OEMs, Engineers, Operations and Maintenance
- RCM-based decision logic delivering pragmatic and effective solutions
- Defined Operating Context - meets specific requirements and sustainable solutions
- Integrated Solution - prevents duplication and omissions through integration with other reliability processes like RCM
- Continuous Improvement - lower overall risk and defect elimination (where applicable)
- Implementation and Sustaining Results

A ROBUST ANALYSIS PROCESS:

This ensures that not only Reliability Engineers are responsible for continuous improvement and sustainable operations, but the valuable and important input from Operations and Maintenance as well as Administrative personnel are captured during the process. The people who know the equipment and processes best and who will ultimately be responsible for implementing the recommendations are involved.
THE RFCA PROCESS:

The RCFA process starts by defining the **FAILED STATE** (loss of function that occurred) and like the RCM process, will consider the Operating Context, or the environment in which the equipment operates in. The Aladon RCFA methodology provides a robust decision logic for determining whether an informal (5 Whys) or formal RCFA approach should be followed. The decision is typically based on the risk associated with the failure (physical or economic risks) and the tolerance for the same. The RCFA process should be applied to repeat failures (bad actors) and one-time failures.

The **OPERATING CONTEXT** provides information that determines the risk (consequence of failure), asset reliability and performance. The Operating Context is further important for developing effective solutions and corrective actions. The Operating Context should include the following:

- The Operating Environment & Environmental Regulations
- Product Quality Standards
- Duty / Standby Arrangements
- Skills and Skills Availability
- Batch or Flow Process
- Safety & Safety Regulations
- Duty Cycles
- Shifts and Shift Arrangements
- Spare Part Policies
- Work in Progress
- Market Demand & Raw Material Supply
- Seasonal Demand
- Logistics
- Protection
- Repair Times
RCFA leads to optimized and sustainable Operations & Maintenance through finding effective solutions to unanticipated failures. The outcomes from the RCFA process will:

- Prevent the failure and associated risk from happening again or at least reduce the likelihood of reoccurring to within tolerable levels
- Recommend one-time changes to design or the way it is operated to reduce the risk to tolerable levels
- Provide asset owners with the knowledge and understanding of how equipment behaves and which failures cannot be prevented or managed proactively
- Target repeat failures and bad actors
- Design and implement the most effective corrective action plan

The RCFA process not only delivers a robust review of equipment and process failures but through its integration with a proactive failure management strategy (such as RCM) provides the most comprehensive risk management approach for all your assets. Operations and Maintenance involvement ensures practical solutions that can be implemented almost immediately. The Aladon process will first favor solutions that can be implemented without redesigning the equipment. Where possible defect elimination will be pursued. If RCM analyses exist on systems where RCFA has been performed, the RCM analyses and implementation will be reviewed to ensure all recommendations are still valid and applicable.

The RCFA process allows quick and inexpensive analysis and verifications for low impact failures and a more robust approach for more serious impact failures through the application of a process that includes a unique combined cause and effect analysis. It further allows for quick evaluation of alternative strategies and solutions. Once the RCFA team can verify that all business objectives are met through the recommended solution (risk associated with the failure will not happen again), risks are eliminated or reduced to tolerable levels, the maintenance program and spare parts are available to support operations, and the implementation of the solution can start.

The Aladon RCFA process is supported by an integrated user-friendly software application that allows for capturing every identified cause, contributing condition, barrier analysis (lack of or failure of) and modifications to process or equipment that preceded the failure or incident. This allows for seamless reporting and sharing of lessons learned organization wide.

**BENEFITS OF RCFA**

- Stakeholder involvement ensures effective solutions
- Robust process, reliability-based solutions
- Transparency, elimination of personal preferences
- Maintenance including critical spare parts and operating parameters defined
- Well defined protective systems (barriers) and maintenance of the same
- An integrated process of failure prevention and management

**CONTACT US**

+1 (910) 399-3867
info@aladon.com
www.aladon.com

P.O. Box 656
Wrightsville Beach, NC
28480, USA