This document provides a practical guidance for the implementation of maintenance reliability methodology, connecting elements of Lean, TPM and Asset management in a simplified approach applying different tools (Principle of Operation, ABC Classification, Fault Tree analysis, FMEA, Machine Cycle Time, SPC, etc.) in a proved sequence to build the a robust asset maintenance strategy, while developing capabilities in the crew.

Part 1: Preparation

1- Define Multifunctional Team Members (from Operation, Maintenance, Quality, Safety, HR (training leader))
2- Define meetings, interventions schedule and alignment with production plan
3- Review Functional Location / Asset tree structure (SAP/CMMS)
4- Review Year to Date top big losses for the plant and by line/equipment
   a. Pre-Work: Collect Downtime data from (CMMS)
   b. Pre-Work: Review Metrics (OEE, MTBF, MTTR, PM Completion, Parts consumption, Maintenance Cost)
   c. Pre-Work: Quality losses (rejects, holds, consumer complaints)
5- Review line criticality (A, B, C classification)
   b. Pre-Work: Collect Safety, Environmental and Quality incidents data (last 3 years)
6- Select equipment most critical “A” equipment and prioritize interventions
7- Define Optimization plan (Objectives and Targets)

Part 2: Understanding Equipment

8- Review Principle of Operation
   a. Description of equipment/process/product flow
   b. Identification of all adjustable points
   c. Review of Centerlines (setpoint, min, max) – SPC basic introduction
   d. Define critical components (considering operational context and consumption)
      i. Review/Define type of maintenance
         1. Predictive (Ultrasound, vibration, oil analysis, thermal)
         2. Preventive (Time Based, Condition Based)
         3. Run to Failure
   e. Define cleaning and inspection strategy (Start-up/Shutdown, Shiftily, Daily, Weekly)
   f. Review Safety Map
   g. Identify/Review all Lubrication points
   h. Define/Review Lubrication Map
      i. Type, amount, frequency
   i. Define Visual Controls

Part 3: Identifying Failure Modes
9- Review Failure modes (FMEA considering downtime, breakdown, quality defects/ rejects/complaints)
   a. Pre-Work: Review Company/Plant Mission, Vision, Objectives and Targets
   b. Pre-Work: Types of downtime, downtime reasons, quality reject reasons
   c. Prioritize Failure Modes based on RPM
   d. Explore Poison and Weibull analysis
   e. Define activities to eliminate/mitigate occurrence, severity and probability of prioritized failures

10- Understand Machine Cycle Time (PLC logic and events)
   a. Pre-Work: Collect Equipment drawings and print latest PLC program
   b. Pre-Work: Print Equipment HMI screens

11- Build/Review standards (operational, maintenance, inspection, cleaning, change-over)
12- Review/Update Work Orders and Maintenance Plan
13- Define Spare Parts required with min/max (based on all above and accessibility/availability)

Part 4: Consolidating Learnings

14- Identify SOP, OPL & training requirements to consolidate the learnings
15- Review/Define Skill Matrix (level 1, 2, 3, 4) for maintenance and operation
16- Establish key Maintenance metrics for performance (MTBF, MTTR, Breakdowns)
17- Review daily maintenance, shift transition and operational meeting agenda/strategy

Expected outcomes:
1- Production scheduling delivering excellence (Happy customers)
2- Quality rejects and holds reduction
3- Equipment Reliability, Availability and Maintainability improvement
4- Life Cycle Cost reduction (failure/breakdown reduction)
5- Corrective maintenance reduction
6- Standards improvement & Checklists optimization
7- SAP and CMMS full utilization
8- Spare Parts Optimization
9- Robust Skill Matrix and Training plan
10- Morale improve: Reward & recognition plan
11- Ideas generation, improvements, productivity projects
12- Problem Solving and Breakdown analysis capability
13- Planned Maintenance process optimization
14- Operation & Maintenance world class performance