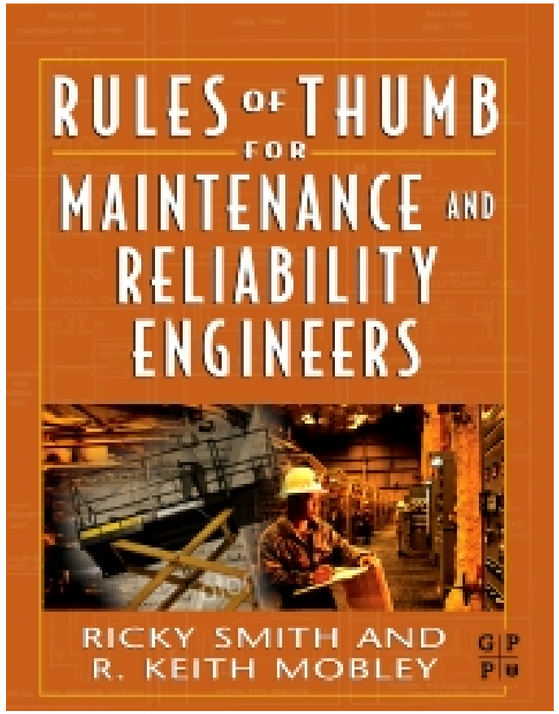
Maintenance and Reliability Assessment

“Use this short and simple assessment to identify where you are?



“Assessment taken from Rules of Thumb for Maintenance and Reliability Engineers”
Elsevier Publishing

by Keith Mobley and Ricky Smith

TABLE 1. Key Maintenance and Reliability Process Principles

Yes / No

1. Does management have roles and responsibilities defined for all the maintenance staff?
2. Does management know and manage with leading key performance indicators?
3. Are the work-flow processes defined for all elements of the maintenance and reliability process, such as planning, scheduling, and work execution?
4. Have the critical assets been defined based on consequence and risk to the business, weighting values to determine asset criticality in areas such as:
    - Safety, Environmental, Capacity
    - Cost
    - Other criteria
5. Has the management team defined the gap between the current and desired plant performance and determined the financial opportunity identified? N/A
6. Is the current PM/PdM (predictive maintenance) program on critical assets based on RCM methodology (RCM, FMEA, etc.)?
7. Does the organization define failure based on the functional failure of the asset?
8. Does your organization have dedicated planner/schedulers?
9. Does the whole organization accept responsibility for reliability?
10. Does your organization use mean time between failure (MTBF) to determine the reliability of your assets?

Total “yes” answers times 10 = (possible 100 points)

TABLE 2: Reliability
Yes / No

1. Are PM/PdM results entered into reliability software to identify *P* on the P-F interval?
2. Does maintenance and production management understand the P-F interval and how it functions to manage asset failure?
3. Does maintenance and production management focus on a *formal* critical assets matrix when determining shutdowns and maintenance work?
4. Is a work order written for all functional failures (partial and total)?
5. Is a formal root cause failure analysis (RCFA) or root cause analysis (RCA) process defined and executed on major and multiple similar asset failures?
6. Is a maintenance or reliability engineer on staff?
7. Does the maintenance or reliability department focus strictly on reliability of the assets and not "project engineering" work?
8. Does your company apply the Six Sigma DMAIC process in its reliability engineering efforts?
9. Is an RCM methodology (RCM, RCM II, RCM Turbo, FMEA, etc.) used to determine the maintenance work strategy for your assets?
10. Do you know what percentage of your assets your maintenance strategy is RTF (run to failure), PdM, detective maintenance, PM (restorations, replacements, lubrication, etc.), and so forth?

Total "yes" answers times 20 = (possible 200 points)

TABLE 3: Reliability Engineering
Yes / No

1. Does your plant have a reliability engineer?
2. Does your plant apply a formal RCFA process on high-value reliability problems?
3. Does the reliability engineer perform only reliability engineering work?
4. Are all projects reviewed and approved to ensure reliability of the assets?
5. Is there validation by engineering, maintenance, and production to ensure a project is completed and operating to design specifications before the project's responsibility is turned over to production?
6. Are projects' costs allowed to continue even after a project has overrun its projected cost? (Are project cost paid for by engineering and not maintenance?)
7. When a project is completed, has an RCM methodology been applied to the equipment to ensure the correct maintenance strategy has been applied to the assets?
8. When a project is completed have all equipment, parts, and the like been entered into the CMMS/EAM?
9. Does reliability engineering focus less than 20% of their time on "bad actors"?
10. Are reliability engineers *not used* as project engineers?

Total "yes" answers times 15 = (possible 150 points)

TABLE 4: Maintenance Planning
Yes / No

1. Are preplanned job packages developed for most of the maintenance work scheduled (all specifications, procedures, parts, labor, etc. identified)?
2. Does the planner use the maintenance staff to assist in the development of preplanned job packages?
3. Is a planner/scheduler (or just a planner) performing the day-to-day job ever called upon to rush in parts for a breakdown?
4. Does the planner identify backlog based on categories (e.g., ready to schedule, waiting on parts, waiting on engineering, waiting to be planned)?
5. Does the planner validate whether a work request is valid?
6. Does the planner provide feedback to the requester when a work request or notification has been entered into the CMMS/EAM system?
7. Does the planner visit the job sites of work to be planned on at least 30% of jobs?
8. Can the planner check status of planned work parts on the CMMS/EAM within five minutes of any job?
9. Does the planner validate work request in three days or less?
10. Do you have at least one planner or planner/scheduler for every 7–25 maintenance personnel?

11.Total “yes” answers times 10 = (possible 100 points)

TABLE 5: Maintenance Scheduling
Yes / No

1. Is someone responsible for scheduling, a full-time planner/scheduler?
2. Do planner/schedulers or schedulers work closely with production to schedule maintenance work?
3. Is maintenance work scheduled one week ahead at least?
4. Is maintenance work scheduled by day?
5. Is maintenance work scheduled with a maintenance person's name assigned?
6. On large outages do maintenance personnel provide input into the schedule?
7. Does the scheduler or planner/scheduler facilitate the maintenance scheduling meeting?
8. Does the scheduler or planner/scheduler not report to maintenance supervision? Reporting to a maintenance manager is acceptable.
9. Is next week's schedule posted at least the prior Friday for all to view to include maintenance and production?
10. Is schedule compliance above 80%?

Total "yes" answers times 10 = (possible 100 points)

TABLE 6: Key Performance Indicators (KPIs)
Yes/No

1. Are the work- flow processes mapped in your maintenance and reliability process with leading and lagging KPIs defined at specific points in these processes?

<u>Does the maintenance department measure the following?</u>

2. Scheduled compliance
3. Percent of planned work
4. Rework
5. Mean time between failures of Critical Assets
6. Percent of time (by vendor) vendors do not deliver on time
7. Percent of time vendors deliver the wrong part
8. Stockouts
9. PM Compliance using a Rule of 10-20% of time frequency
10. Percent of assets, ranked based on criticality
11. Percent of assets for which RCM methodology is applied and the maintenance strategy changed based on the data
12. Bad actors report
13. Number of potential failures identified
14. Percent of assets for which functional targets are identified
15. Percent of work proactive
16. Percent of work reactive
17. Maintenance material in stores as a percent of RAV Maintenance cost per unit produced
18. Are the KPIs listed above posted for all to see in the maintenance department?
19. Are their targets and goals established for all KPIs?
20. For each KPI the maintenance department uses, is a standard definition, objective, calculation, example calculation, roles, and responsibility assigned?

Total “yes” answers times 10 = (possible 200 points)

TABLE 7: Education and Training
Yes / No

1. Have each Maintenance Tech been trained in the Basics of Proactive Maintenance?
2. Do Maintenance Techs use Repeatable Procedures with specifications and step by step instructions on all critical work?
3. Have all Maintenance and Production Leadership actively demonstrated support for Maintenance Best Practices?
4. Have all management personnel been trained in the basics of reliability?
5. Have all Maintenance Planners gone through formal Maintenance Planning and Scheduling Training?
6. Is the Maintenance Storeroom Access controlled 24/7?
7. Do skilled maintenance workers use preplanned job packages with procedures over 90% of the time?
8. If all management personnel have been trained in the basics of reliability, do they demonstrate this knowledge in their job?
9. Have all plant personnel been trained in the basics of reliability?
10. Have executive management personnel been trained in the basics of reliability?
11. Have all maintenance personnel been trained in the basics of root cause failure analysis?
12. Does the plant have a skills training program for all maintenance personnel and is it based on a skills assessment?
13. Does the company have an apprenticeship or entry-level training program for maintenance and production?
14. Are skilled maintenance personnel hired from inside and outside the company administered a written and “hands-on” test?
15. Does the plant have a maintenance training budget that equals or exceeds 6% of the maintenance labor budget?

Total “yes” answers times 10 = (possible 150 points)

Scoring

Add all Points from each section and determine the current status of your Maintenance and Reliability Process

0–500 = Total reactive (reliability principles are not understood or applied). The company needs to educate all management and engineering personnel in reliability and develop a reliability strategy for serious change. It needs to develop a business case to define the opportunity immediately. Read the book.

501–700 = Emerging (long way to go). The company needs to develop a business case and reliability strategy with a timeline, targets, and objectives.

701–850 = Proactive (continue the journey, you are headed in the right direction). The company needs to ensure that a continuous improvement process is built into its asset reliability process. Identify gaps in the assessment and fill the gaps.

851–1000 = World Class. The company should hire an outside reliability consulting firm to assess its current status and make recommendations for any change required. Great job.

"Rules of Thumb for Maintenance Reliability Engineers" provides knowledge and solutions how to transition your Maintenance/Reliability from current state to a more proactive state. This assessment came from Alcoa Mt Holly (1st Maintenance Department Certified as meeting "World Class Maintenance" Standards) and known best practices based on knowledge and experience from Keith Mobley and Ricky Smith plus other trusted Maintenance and Reliability Professionals who contributed to this book.