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INTRODUCTION

This Resource Booklet is issued to applicants of The Australian Maintenance Excellence Awards (AMEA) to assist them with an understanding of what is required of a maintenance organisation wishing to demonstrate excellence. It may also assist in the preparation of submission documentation and site presentation, as required by The Australian Maintenance Excellence Awards, however the Criteria and Applications Guidelines booklet provides detail on suggested structure and content of the submission. This booklet contains a detailed version of the Award criteria for each category.

The material is not intended as a prescriptive step-by-step approach to the management of the maintenance processes. It is detailed in nature to ensure a clear understanding is gained on the extent of each category (breadth and depth). The detail provides guidelines for driving and sustaining maintenance excellence and outstanding performance. A statement of intent has also been provided with each category.

This document is part of a companion set of Australian Maintenance Excellence Awards material which includes:

- Criteria and Applications Guidelines
- Self-assessment Booklet
- Evaluation Team Booklet.

The Industrial Maintenance Roundtable (IMRt) wishes to acknowledge:

- EI DuPont de Nemours & Co who have provided insight and information gained through its Maintenance Excellence Recognition Process (MERP) and who very kindly made MERP material available to IMRt to assist the development of The Australian Maintenance Excellence Awards.
- the Australian Quality Council for its support and expert advice given freely to the IMRt during the development of The Australian Maintenance Excellence Awards.
- the National Minerals Industry Excellence Award for Safety and Health which provided a model for the development of this award.

A COMMITMENT TO EXCELLENCE

The awards criteria encourage excellence in maintenance practices and performance leading to excellence in business results.

There is growing international acceptance that a regular, systematic review of an organisation's activities and results against appropriate criteria allows it to clearly identify its strengths and improvement opportunities. This provides the foundation on which business strategies can be modified for optimum performance.

The Australian Maintenance Excellence Awards criteria are similar to those being used internationally by many organisations to evaluate and recognise maintenance excellence.

The IMRt encourages enterprises to continually evaluate their maintenance function and practices and the contribution to business performance. They may wish to use the criteria in this document and the companion documents as guidelines for evaluating maintenance practices and performance.

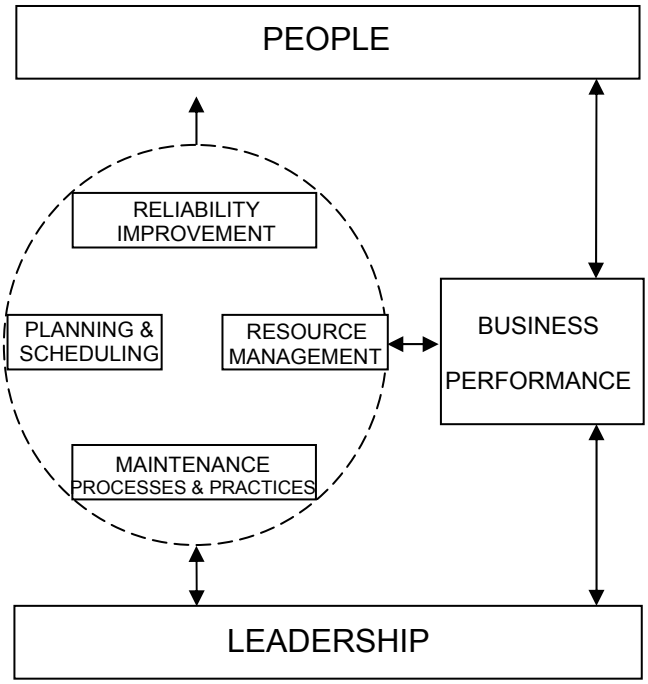
Award recipients would be expected to perform well across all categories. This would demonstrate a sound, integrated and well-deployed management approach is in place, desired results are beginning to flow, key performance objectives are being achieved, and the processes demonstrate that they are sustainable.

By using these criteria, enterprises will be able to evaluate their capabilities of managing maintenance through self-assessment. By applying for the Australian Maintenance Excellence Awards they will receive an external assessment from a trained team of evaluators drawn from industry. Evaluated submissions will be used as the basis for recognising the recipients of the Australian Maintenance Excellence Awards.

AWARDS CRITERIA

The following criteria describe each of the categories in detail. This description includes a generic interpretation of the intent of each category (found immediately after the name of the category). If a Company were to be considered for The Australian Maintenance Excellence Award, they must firstly apply to have their Application approved, then proceed with a submission. The submission must provide evidence of their commitment to the continuing improvement of all processes which affect maintenance within the organisation.

The extent to which that commitment is reflected in its day-to-day operations and the contribution that continual improvement has made to the success of the organisation will be taken into account.



Seven categories describe the key elements of maintenance management systems and the diagram above shows the relationship between these categories.

Leadership

The role of leadership in the creation of a culture that supports continuous improvement in the management of maintenance.

People

The extent to which people (at all levels) in the organisation are committed and appropriately skilled to safely and effectively achieve the goals and objectives of the maintenance organisation. The way the organisation manages and evaluates the contribution of its people in achieving organisational objectives.

Planning and Scheduling

The way the organisation provides its personnel with appropriate support, information, materials and resources, and coordinates its maintenance activities.

Maintenance Processes and Practices

The way the organisation collects, analyses and uses data to predict appropriate maintenance activities and how it employs preventive techniques to meet the goals of the organisation.

Reliability Improvement

The extent to which maintenance is attuned to the needs of its customer and in particular the strength of the focus on the reliability of equipment, the identification and elimination of the root cause of failure and the prioritising of improvement tasks according to safety impact or business benefit.

Resource Management

The way that the organisation manages the materials used by maintenance and the way it manages contract and consulting resources that are engaged to support the maintaining function.

Business Performance

The extent to which the operation demonstrates sustained improvement to the key objectives and performance indicators, and how this contributes to the overall performance of the organisation.

LEADERSHIP

The leadership criterion examines the role of leadership in the development of the maintaining function within the organisation at a corporate and enterprise level. Management's dedication to a successful, comprehensive maintenance program may include the following support structures:

1. An established planned maintenance philosophy covering:

    - A written maintenance philosophy statement for the plant/business unit that incorporates uptime and the elements of planned maintenance and relates them to the business objectives of the plant which includes safety.
    - Endorsement by plant/business unit management, with broad dissemination in the organisation and an understanding at all levels,
    - A recognition on the part of all persons involved that the planned approach to maintenance be followed with strict discipline to assure that all maintenance activities focus on the needs of the business, and
    - Agreed upon priorities for maintenance work that are observed by all those involved in the act of processing this work.

2. Planning for continuous improvement with established goals and objectives focusing on the following basic factors:
    - People
    - Equipment
    - Materials
    - Methods
    - Environment (including adaptation to changing technologies).

    These factors could be demonstrated as follows:
    - A five-year strategic plan with defined objectives and internal commitment to meet the plan,
    - An established method for measuring progress on the plan including trend charts,
    - Personnel practices that provide recognition for exemplary performance,
    - A focus on equipment reliability,
    - A material supply policy that strives toward optimising cost and providing a higher level of service, and
    - Integration of predictive/preventive, planning and scheduling, and reliability engineering strategies to optimise maintenance's contribution to the business.

3. A site-wide leadership network whose task is to set expectations and monitor performance for continual improvement and functional effectiveness in the maintaining function. A member of the plant manager's staff is a member of the network and is responsible for championing the network and its projects. Consideration may be given to the following:

    - Leadership network containing representatives from all relevant business units, stores, central services, etc., as appropriate to the size of the plant,
    - Network members having appropriate authority to represent the interests of their organisations,
    - The plant staff member sufficiently involved with the network to adequately represent its interests in routine staff level business,
    - A written mission statement for the network, and
    - For a business unit, this item may only involve identifying the maintenance champion for the unit and his responsibilities.

4. Regular meetings, formal agenda, and published minutes of site-wide maintenance team meetings. Important elements for consideration would include:

    - Network meetings that are substantial and timely with results broadly communicated, and
    - Frequency and degree of formality will depend heavily on the size of the plant.

5. Application of procedures as outlined in Company reference documents, such as "Maintenance Procedures," Company Engineering Standards, Environmental and S&OH guidelines, with consideration being given to the following:

    - Personnel are familiar with the content of available standards/procedures, and
    - Standards/procedures are updated and easily accessible to users.

PEOPLE

Instructional programs enabling employees to acquire the knowledge, skills, and proficiency necessary and also to demonstrate personal performance and the use of skills, competencies and approach in performing planned, preventive, predictive and reactive maintenance tasks may be covered by the following:

1. There must be a path forward, incorporating a vision of the future of the maintaining function, built into the overall site plan. Questions that need to be addressed in that vision include:

   - What will maintenance personnel of the future look like?
   - What skills will they need?
   - How will they acquire the necessary skills?

   This may require a reasonably accurate description of future business direction, the long-range maintenance strategy incorporating, concepts representing leading edge technology i.e. TPM and a human resource development program and program co-ordinator.

2. An emphasis on safety training. This may also cover specialised training for all employees exposed to electrical and mechanical hazards.

3. A process for the evaluation of the contribution of its people in achieving the objectives covering the following:

   - Measurement of people effectiveness,
   - Appropriate recognition and reward process, and
   - Individual as well as team contributions are catered for.

4. An effective and systematic communication process is evident and encourages both the formal and informal communication with management and each other.

5. Employees are encouraged to become fully involved in the business and maintenance operations and how the organisation maintains an environment that enables full potential of its people to be recognised incorporating:

   - Specific ways in which people are empowered to act, initiatives taken, etc., and
   - Working together and accepting responsibility for effecting change in their work place to both achieve customer objectives.

6. Established task listing that details the skills each employee needs to acquire (needs analysis, job analysis, etc.) All personnel groups requiring the skills should be involved in the development of the training objectives. Task listings should be reviewed by all affected by skills, i.e., maintenance supervision, production etc.

7. A personnel plan that addresses the following questions:

   - What are existing skill levels and demographics of the work force?
   - What present operations require additional skills and/or training of personnel?
   - What are the needs for skills over the next two years?
   - What new processes or technologies will affect the operation?

   A designated maintenance training co-ordinator function is desirable, preferably whose responsibility is human resource development and has close ties to each business unit to recognise immediate and future needs of each business.

8. A formalised plan that considers available external resources to train personnel, such as technical schools, community colleges, other plants, or where offered, apprentice and craft-certification programs.

9. Participation in a formalised training program.

   The key elements that need to be present are:

   - An evaluation of the program to see that it effectively meets the needs of the business,
   - Continuously maximises the value of the program with the agreement of proper authorities,
   - A selection process to determine who enters the program,
   - A program to retain trained employees after completion of their program, and
   - Interaction with authorities and external resources to guide and influence the program.

PEOPLE

10. A formalised multi-skills training plan to develop versatility in the work force, covering the following:

    - A completed job analysis for each job responsibility to identify all tasks done within each job responsibility,
    - A training plan that identifies the training required to achieve competency in each skill,
    - Adequate physical and technical resources to implement the training program, and
    - A system or approach that addresses the needs of the incumbent trades and technician personnel.

11. A hands-on approach to developing troubleshooting skills with skill demonstrations designed to develop confidence and experience. Facilities and subject matter experts to provide hands-on training is necessary with skill demonstrations based on actual tasks performed in the field as well as teaching troubleshooting logic.

12. Resource personnel available to answer questions arising during or after training sessions. Consideration given to the provision of or access to:

    - A designated maintenance training co-ordinator whose responsibility is human resource development, and
    - Easily accessible competent subject matter experts identified for each training subject.

13. Self-paced training methods to accommodate differences in learning, skill levels, etc. with provision of:

    - Self-study work stations such as interactive video, student workbooks, etc, and
    - Subject matter experts available for students when they have questions or for demonstrating competency.

14. A means of measuring results, such as task-certification programs, using content valid tests that verify competency on tasks that are performed in the field.

15. Detailed training records to track the effectiveness of the program. This may be done by using:

    - A designated maintenance training co-ordinator whose responsibility is human resource development, and
    - A system to document training activities and the needs of each employee.

16. Measurement of maintenance training results – performance of maintenance training routinely measured and tracked.

    - A set of indices and goal levels, agreed upon by the business, should be established to accurately measure maintenance training performance, and
    - These metrics may be measurements of functioning capability and may compliment the business metrics in the section headed Business Performance. Typically, performance measurements dealing with cost effectiveness, quality, schedule compliance for mandated training, currentness of task analysis, etc. may be used.

17. Supervisory and management personnel with responsibility for maintenance need to have been adequately trained in maintenance practices and systems. Recent participation of key personnel in suitable training courses would be ideal.

PLANNING & SCHEDULING

A Planned Maintenance system is the most effective method to improve the maintaining function. The Planned Maintenance system may include:

1. A work order system used to make assignments to craftsmen/technicians and to accumulate maintenance data. The system may include a description of the job to be done and collection of cost and failure history.

2. Maintenance personnel dedicated to the task of planned and scheduled maintenance including predictive and preventive activities. Implementation of the preventive maintenance program should be a focus for this group of personnel.

The key elements of the process that need to be in place include:

- A planned maintenance strategy that recognizes the four aspects of maintenance: corrective, predictive, preventive, and repairs maintenance,
- An effective material procurement system,
- Levels of activity established for each of these four elements of maintenance based on an analysis of the needs of each business unit and manufacturing step, and
- A philosophy and dedication that recognizes the value of preventive and predictive maintenance and assures that maintenance schedules which list these activities are adhered to and defects are eliminated.

3. Methods of formal planning and scheduling.

   A system to efficiently process maintenance work that meets the particular needs of each business unit should usually achieve the following:

   - Effective allocation of maintenance resources,
   - Prioritised work tasks,
   - Effective supply of materials, and
   - Positive impact on equipment uptime.

4. Measurement of Planning and Scheduling Results – Performance of the planning and scheduling system should be routinely measured and tracked.

   The system could be demonstrated by:

   - A set of indices and goal levels agreed upon by the business and established to accurately measure planning and scheduling performance, and
   - The metrics used should be measurements of functioning capability and complement the business metrics in the section titled Business Performance. Where possible, performance measurements should deal with the level of planned work, scheduling effectiveness, level of unscheduled work, backlog, etc.

5. A means of sharing planning and scheduling information with production personnel and business teams. This information may be:

   - Performance data presented in a format that is relevant to the needs of production and business teams, and
   - Periodic communication processes, evident in written reports, meetings, presentations, etc.

6. Regulated Inspections and Repairs Documentation of feedback from regulated repairs and inspections needs to be formalised. The following questions should be answered for inspections:

   - Do records for inspections and repairs mandated by statutory, voluntary (e.g., ISO 9000), and meet the requirements of local codes and corporate standards? (Items that may be affected by such requirements include expansion joints, pressure vessels, boilers, liquid-filled electrical equipment, pressure gauges, etc.)

   This can be further clarified by the*:*

   - Identification and understanding of the particular codes and standards that relate to the repairs and inspections that must be conducted,
   - Established frequencies for inspection and repairs,
   - Individuals or groups assigned the responsibility for making the repairs of inspections,
   - Method of collecting meaningful information about deficiencies discovered and remedial action taken,
   - Adequate documentation such as maintenance and repair manuals for instruments and analysers, and
   - Calibration standards for checking analysers and instrumentation.

Repairs could be addressed by answering the following questions:

- What was the nature of the repair?
- Was the required repair completed?
- Was the repair effective?
- Was the equipment modified or reconditioned to increase its useful life, reliability, product quality or yield?

The accompanying documentation for repairs may cover:

- Identification of the problem,
- A brief explanation of the repairs performed,
- A determination, where applicable, of the cause of the failure, and
- A method to evaluate the effect of corrective maintenance.

Inspections may be addressed by answering the following questions:

- Are the inspection checklists and routes being followed?
- Are the inspection tools and test devices adequate?
- Can equipment be modified to facilitate inspections?
- Does inspection frequency appear to be adequate?

The documentation for inspections may cover elements such as:

- Inspection procedures that describe required actions and/or measurements, inspection tools, test devices, adequate calibration equ9pment and test standards, etc., and instructions indicating the disposition of information collected,
- A method to identify and remedy situations where it is difficult to conduct required inspections,
- A system that periodically examines inspection records in order to optimise inspection frequencies, and
- Exception reporting.

7. Systematic, continuous review, revision and refinement of the planned maintenance system.

   The methodology employed for this element may contain the following aspects:

   - A review conducted periodically to assess the value the system is adding to the business,
   - Each element of the maintenance activity is examined to be certain it is meeting the needs of the business in a cost-effective manner, and
   - Procedures and processes of those elements not adding value to the business are revised to make them more additive. The revisions should be tested against the same criteria after a reasonable period to demonstrate improved performance.

MAINTENANCE PROCESSES & PRACTICES

Systems and methodologies for inspection should be developed by a broad-based group of experts so that the inspection plan is comprehensive. An effective inspection system may include the following:

1. Inspection routines aimed at assessing and improving equipment conditions and reliability. The routines could include the following:

    - Identifying the critical equipment and instrumentation for inspection. Inspection frequencies determined. Inspection criteria identified, and
    - Critical equipment and instrumentation may be defined as equipment whose failure could impact on safety, environment, quality, throughput, etc.

2. Inspection assignments for operators, mechanics, or technicians with detailed, written checklists or job plans. They could be written checklists or job plans with agreed-upon assignment responsibilities and frequencies.

3. Consideration of all primary indicators such as:

    - Noise levels,
    - Lubrication status,
    - Visible leaks or emissions,
    - Operating variables (temperature, pressure, etc.),
    - Physical condition (paint, corrosion, etc.),
    - Quality level of output (rejects, off-spec material, etc.),
    - Productivity levels,
    - Frequent alarms or alarms that are disabled,
    - Nuisance tripping of motor overloads and circuit breakers,
    - Visible corrosion on electrical terminals or conductors,
    - Hot components or signs of hot electrical components operating above rated temperature, burned insulation, and paint, etc.,
    - Abnormal instrument readings, changes not verified by other conditions, changes after an adjacent electrical storm, and
    - Dirty or clogged filters and cooling vents on motors, control panels, analysers, etc.

    The inspection routines may consider all primary indicators about the equipment being inspected.

4. Formal check-sheets and procedures are supplied for inspections, and followed exactly as specified on the check-sheets, at the specified frequency.

    The sheets may include special instructions in the form of check-sheets, procedures, and schedules that indicate components to be inspected and techniques to be used.

5. Safety inspections to be consistent with manufacturer's specifications and in compliance with government regulations. If available, site specifications to also be complied with, including any special procedures identified.

6. Discrepancies found during safety inspections are to be documented and corrective actions taken and documented before the process can be safely returned to operation.

    Also, special procedures to include a feedback requirement for conditions found, action taken, and safeguards against operating under unsafe conditions.

7. The plant safety resource should be involved in the preventive maintenance process. If there is not a plant safety resource at the site, proper engineering effort should be incorporated into the high-priority preventive maintenance process.

    It is very desirable to ensure:

    - Qualified safety resources who are connected to all appropriate safety networks be available to the site, and
    - Procedures that establish the extent of involvement of the safety resource.

MAINTENANCE PROCESSES & PRACTICES

8. Surveying plant equipment to determine the applicability of the various predictive techniques and to establish the extent of the program.

   This summary may include the identification of critical equipment, common modes and causes of failure, and primary indicator that a failure has occurred. Appropriate indicators are vibration and lubrication analysis, infrared thermography, ultrasonic noise measurement, etc.

9. Establishing predictive measurement levels and frequency of checks.

   This may be done in a manner that:

   - Utilise experience and successes of previously established predictive maintenance programs to determine measurement levels and frequencies, and
   - Seeks support of predictive maintenance specialists, appropriate standards and technical resources to help establish and maintain the program.

10. Building a database for each appropriate predictive indicator.

    The database may include:

    - Identification and acquisition of data needed to facilitate the predictive maintenance program, and
    - Appropriate techniques to manipulate the data to perform analysis and trending.

11. Scheduling and performing repairs based on predictive trend analysis.

    The schedule may provide:

    - Parameters established to prioritise work based on the needs of the business, and
    - A method to schedule corrective action based on trend reports.

12. Incorporating predictive maintenance concepts in the design of new equipment through interaction with engineering groups and vendors.

    This can be demonstrated by:

    - A strategy that has as a goal the recognition that all new equipment be examined for opportunity to incorporate predictive technology into equipment design,
    - Personnel identified to act as liaisons with engineering groups and vendors to identify opportunities to incorporate predictive technology into new and modified equipment, and
    - A plant policy that involves other applicable plant organisations (i.e., purchasing) in the effort to incorporate predictive technology into new and modified equipment design and purchases.

13. A process to select the optimal lubricant, amount, and frequency of application based on past experience, engineering standards, or supplier recommendations.

    The key elements that need to be considered are:

    - Personnel trained in the application of lubrication technology and utilised to establish plant standards,
    - Standards readily available for lubricators and supervisors, and
    - Responsible individuals identified to co-ordinate and administer the lubrication program.

14. Lubrication surveys that locate and identify lubrication points on all equipment.

    Ensure surveys, routes, and schedules indicating that lubrication needs have been identified.

MAINTENANCE PROCESSES & PRACTICES

15. A realistic lubrication schedule that allows for time to do the job properly.

    A pre-analysis of the time required to perform each lubrication task may need to be carried out.

16. Established standard practices for routine and repetitive lubrication functions on a wide variety of equipment, such as electric motor bearings, flexible shaft couplings, rolling contact bearings. Documenting these standards and having them easily accessible, is desirable.

17. Audit plan to assure inspections.

    The auditing process may also be used to determine the timely completion of inspections, as well as a tracking device and answer questions, such as:

    - What techniques are used to assure that inspection repairs occur?
    - Are inspections scheduled in a routine and timely fashion?

18. Preventive/Predictive Training.

    The predictive/preventive maintenance work force must be properly trained to carry out the program.

    The program could include elements such as:

    - A strategy that identifies PPM techniques needed to support business goals,
    - A training program that encompasses the PPM techniques to be used on critical equipment, and
    - References are available (such as the Engineering Standards and the Predictive/Preventive Maintenance Technology Guide).

19. Metrics to measure the performance of the predictive maintenance program are present and include:

    a. A set of indices and goal levels, agreed upon by the business, and established to accurately measure PPM performance, and
    b. The measurements are measures of functioning capability and should compliment the business metrics in the Section headed Business Performance. Where possible, performance measures should deal with schedule compliance, defects found and eliminated, impact of the PPM effort on business drivers, etc.

20. Describe the mechanisms used to stay in touch with varied sources of leading edge functional technology.

    For example:

    - How are you linked with suppliers, technology products, programs?
    - Do you have other input sources?
    - Do you communicate your learning forward to the corporation?

    The learning may come from interactions with equipment suppliers, vendors, technical societies, engineers, designers, etc.

21. A formalised system of contacts with sister plants worldwide to leverage and exchange information and technology.

    Factors for consideration may include:

    - A product-oriented network of key personnel from all sister plants,
    - Functional and regional network representation; for example, electrical safety, electrical distribution reliability, predictive/preventive maintenance, Mid-America resource sharing, and materials engineering/inspection,
    - Formal and informal information exchanges, and
    - A willingness to share problems and accomplishments.

RELIABILITY IMPROVEMENT

The reliability improvement system comprising of formalised problem-solving techniques focusing on increasing uptime, improving yields and process reliability, and assuring quality. The system may incorporate the following:

1. A reliability improvement team with members representing all site activities such as maintenance, production, and support functions ensuring that:

   - Team expertise is appropriate to the task, and
   - Team members' primary task should be reliability engineering.

2. A long-range program that enhances equipment reliability through six distinct phases:

   - Initial design to enhance maintainability and optimise reliability through life-cycle cost analyses and process simulation,
   - Installation and start-up of equipment to minimise "infant mortality",
   - Proper operation of equipment during its normal life span,
   - Extension of operating life through the application of predictive and preventive maintenance techniques,
   - Extension of time between overhauls through the use of predictive maintenance techniques, and
   - Defect elimination through root-cause analysis.

   The key elements present in these mix phases are:

   - Responsibilities for maintenance liaison with new project design work are clearly defined and assigned to qualified personnel,
   - Experienced personnel with defined maintenance and operating responsibilities assigned to assist during project installation,
   - An ongoing operator training program, and
   - An effective predictive and preventive maintenance program is in place.

3. Team emphasis on uptime that includes minimising time lost in setup or product-type changes.

   Systems in place may include:

   - Identification of sources of significant lost time, and
   - Assignment of appropriate resources with goals, schedules, and responsibilities.

4. Techniques in place for increasing uptime, including:

   - Organising the workplace so that everything is in place before shutting down equipment,
   - Improving the methods used in product changeovers, routine maintenance, and repairs, and
   - Minimising control adjustments.

   This may be demonstrated in the following manner:

   - Written and up-to-date shutdown procedures, and
   - Plant goals, objectives, and programs directed at these types of improvements.

5. Effective system to attack equipment problems or failures that includes techniques such as:

   - Identification and qualification of the problem – Pareto diagrams, histograms, etc.,
   - Analysis of the problem,
   - Definition of the underlying root cause,
   - Corrective action, both interim and long term,
   - Effective measurements of corrective action,
   - Ongoing control procedures,
   - Tracking improvements to determine if a positive trend exists, and
   - Measuring costs of reliability problems in terns of uptime, cost and quality.

RELIABILITY IMPROVEMENT

The key elements are evidenced by:

- A system identifying equipment or components causing lost production,
- A method of prioritising improvement activities, and
- A system ensuring that appropriate technical resources are brought to bear in a timely fashion to effect long-term problem solution.

6. Measurement of reliability engineering results – performance of the reliability engineering system must be routinely measured and tracked.

   Consideration may be given to a process that includes:

   - A set of indices and goal levels, agreed upon by the business, should be established to accurately measure reliability engineering performance, and
   - Metrics that should be measurements of functioning capability and compliment the business metrics in the section headed Business Performance. Where possible, performance measurements should deal with uptime, cost/benefits of the system, quality improvements, etc.

7. A data processing system to record the accumulated maintenance data and machine reliability information (e.g., data on repair actions, downtime frequencies, most frequent failure modes, mean time between failure, etc.). It should also track cost, production loss and failure history by equipment piece or system.

8. Reports, graphs, and charts which display basic information, such as labor dollars, downtime hours, equipment material dollars, equipment downtime occurrences, etc.

   Consideration may include:

   - The determination of what information is important to the business mission of the operation,
   - Reports designed to align with information needs, and
   - Information accessible to all levels of the organisation with a need to know.

9. Proper records should be maintained for each inspection on each piece of equipment and a history filing system containing all pertinent records.

10. The reliability improvement program should include periodic audits to make sure that all elements are being applied. The program may also cover:

    - A history of equipment improvements over time, and
    - Measurable business results.

RESOURCE MANAGEMENT

Because measurable savings can be made in the area of maintenance materials management, a dedicated inventory/stores management system can enable sites to achieve significant results. A formalised system for contractors and consultants management is in place at the site. The following criteria applies to these systems:

1. An active site network may be present to drive continuous improvement in materials management. The network ideally includes representatives from groups such as:

   - Maintenance,
   - Stores,
   - Procurement,
   - Design,
   - Integrated supplier,
   - Business services, and
   - Construction.

   To achieve full benefit from the network consideration may be given to the following:

   - A structure and process to identify and address opportunities,
   - The network must be recognised and empowered to make decisions and implement change for continuous improvement in the materials function and
   - Site materials champion identified to lead materials management.

2. Standard descriptions of equipment, parts and supply items are key to the process.

   The direction taken could be:

   - Key nouns, equipment types, materials of construction, manufacturers and vendor codes validated against a standard with terminology consistent within a specific site as a minimum, and
   - A standard format used for various types of materials; i.e., bearings, fasteners, transducers, etc.

3. Measurement of materials management results – performance of the materials management system routinely measured and tracked.

   This may take the form of:

   - A set of indices and goal levels, agreed upon by the business, established to accurately measure materials management performance, and
   - The metrics used be a measurement of functioning capability and compliment the business metrics in the section headed Business Performance. Examples of typical performance metrics are:

   - Total stores investment (as a percentage of plant replacement value),
   - Service level (percentage of items supplied when requested),
   - Utilisation of the materials data base (percentage of purchases made using the materials data base versus direct ordering),
   - Utilisation of prearranged purchase agreements (percentage of purchases made against prearranged agreements), and
   - Etc.

4. Effective management of maintenance material working capital taking into account the following:

   - A written procedure for inventory classification such that classification is not driven by availability of capital funds,
   - A practice to routinely review existing stores and extra machinery items for proper classification,
   - A written procedure to routinely review and dispose of excess and obsolete material. Procedure to include a review of inventory when design changes occur or new equipment is installed or equipment is abandoned,
   - Use of integrated supply, vendor stocking and consignment programs, and
   - A written practice to control order point, order quantity, inventory level and item duplication.

5. Rebuilding programs for items, such as motors, valves, transformers, controllers, printed circuit boards, and seals should be operational. Included for consideration under this item are the following:

   - A procedure for review of existing and new-item setup to identify and set up as repairable items,
   - A procedure to assure operating spares are promptly reconditioned, tested and re-inventoried,
   - Quality standards must be agreed to and documented with a remanufacturer before acceptance and be subject to routine audits, and
   - Remanufacturing efforts networked with corporate resources.

6. Consideration may be given to implementing an alternative materials procurement program (sourcing by other than the original equipment manufacturer) for appropriate materials.

   A program of this type would need to ensure that:

   - A procedure is in place for periodic review of existing and newly set up items for alternate sourcing,
   - Machined parts are detailed for alternate sourcing, and
   - Alternate sources are identified and qualified, such as machine shops, instrument repair shops, foundries, etc.

7. Preferred/Prearranged Sourcing is considered.

   The sourcing process could include the following:

   - A new item setup procedure identifying the preferred suppliers. Key items receive joint review by the site network so that vendor of record reflects preferred sourcing,
   - Awareness by engineers and designers that corporate preferred supplier agreements are to be used for selecting equipment installed on capital projects, capital work orders, and design change requests, and
   - Replacement equipment and parts are acquired through preferred suppliers which includes alternate sourcing when more cost effective.

8. Partnerships with suppliers aimed at improving material quality and performance while reducing inventory and costs are developed and in use.

   Techniques that can be employed to enhance this item are:

   - Supplier stocking/consignment techniques are used to reduce physical inventory,
   - Blanket orders are used where appropriate,
   - Minimise use of the one-time spot order,
   - Minimise emergency orders,
   - Feedback process to supplier to resolve quality discrepancies,
   - Use of electronic data interchange (EDI) where functional capability exists, and
   - Line supervisors and engineers are aware of the scope of partnerships and are encouraged to access supplier resources for maintenance improvement programs.

9. Good materials planning partnerships have commenced.

   Some of the elements for consideration in a good planning process are:

   - A strong focus on materials planning as a major element to scheduling and planning maintenance work activities well in advance of the activity,
   - Equipment downtime is not frequently extended because of material availability,
   - Critical spare parts are identified and safety stock levels determined, and
   - Maintenance schedules are not modified because of material availability.

RESOURCE MANAGMENT

10. A standardisation program minimising the different types of materials and equipment, required.

    The process used may consider the following:

    - Use types of materials and equipment which fulfill common, if not identical, needs in a cost-effective manner,
    - Review design for new equipment, and purchases for standardisation opportunities,
    - Standards should be consistent with corporate supplier convergence initiatives, and
    - Identify and link equipment to minimise parts inventory.

11. Complete bills of material are maintained for site equipment to quickly and easily identify replacement parts.

    Elements for consideration may include:

    - A system to maintain bills of material for site equipment, and
    - Bills of material available to the user community and are used for maintenance planning and scheduling.

12. A contracting strategy, driven by site principles, and may include the following:

    - Developed by site leadership, and an integral part of site business and maintenance strategy,
    - Contractor employee roles and responsibilities are identified,
    - Strategy is understood by all site personnel, and
    - Strategy is supported by line organisation.

13. Recognition/resolution of employee issues.

    This may focus on the following:

    - Job security issue is addressed,
    - Community impact addressed, and
    - Where appropriate, a retraining and transition process is in place.

14. A contractor selection process has been developed and may incorporate the following:

    - Contractor capabilities and types of contracts are aligned with business needs,
    - Contractor selection is consistent with best practices and corporate guidelines, and
    - Expectations of each party are clearly identified.

15. A working relationship is built and this may be demonstrated by:

    - Supporting continuous improvement, and
    - Mutual respect, trust and confidence.

16. A management process is present that may include:

    - Management support,
    - Adequate contract administrators and resources,
    - Trained contract administrators,
    - Clear and defined contract administrator roles and responsibilities,
    - Contractor orientation and training program,
    - An audit system for contractors to ensure that the Organisation receives the intended value for services contracted, and
    - Safety training and standards setting.

17. Measurement of maintenance contracting results – performance of maintenance contracting is routinely measured and tracked.

    A typical process would contain the following:
    - A set of indices and goal levels, agreed upon by the business, established to accurately measure contracting performance, and
    - The metrics measuring functioning capability and complimenting the business metrics in the section headed Business Performance. Where possible, performance measurements should deal with safety, cost effectiveness, quality, schedule compliance, etc.

BUSINESS PERFORMANCE

The extent to which the operation demonstrates sustained improvement to the key objectives and performance indicators, and how this contributes to the overall performance of the organisation. Measurement of Business Results - When administering a maintenance excellence program, it is important to know just how effectively the program is performing in relation to the overall contributions of the maintaining function to the business it supports.

1. To that end, measurements need to be made that determine how well the maintenance function supports the concept of uptime, reliability, etc. Generally, measurements may be made in four areas:

- Quality -

  The impact of maintenance could be measured by assessing, among other factors:

  - The amount of scrap and rework associated with machine breakdown,
  - Out-of-tolerance equipment, and
  - The percent of increase, if any, in total output of quality product.

  Consideration could also be given to:

  - Identification of where, in the process, maintenance of the facility will have an impact on product quality, and
  - A monitoring and reporting system to measure and communicate results.

- Productivity -

  Productivity may be measured as a percent of capacity. Excellence in maintenance increases the productivity of a plant or site in a measurable quantity. The traditional standards of productivity - units of product produced by worker, etc., - are measures of the effectiveness of the maintenance program.

  Total unscheduled downtime, as well as the cost of unscheduled downtime, is another accurate measure of the efficiency of the maintenance program.

  The effectiveness of maintenance can also be measured by the total cost of maintenance divided by finished product produced (units, etc.).

  Consideration could also be given to:

  - Identification of productivity measures that can be influenced by maintenance and are important to the business served, and
  - A system for data collection and results updating.

- Profitability -

  Excellence in maintenance is reflected in business results. When maintenance costs are reduced through improved maintenance procedures and programs, those savings affect overall profitability.

  This may be demonstrated by:

  - A maintenance cost improvement program,
  - An uptime improvement program,
  - A quality improvement program for maintenance,
  - Safety & Environment, and
  - Etc.

BUSINESS PERFORMANCE

- Safety & Environment -

  Excellence in maintenance requires that safety and environmental priorities be incorporated in all aspects of the function. The priorities must show excellence in safety and environment is a competitive advantage for the business.

  Elements that should be considered are:

  a. Metrics that assure correct parameters are being monitored on a timely basis,
  b. Schedules for safety and environmental inspections, testing, and reconditioning are realistic and based on actual conditions, and
  c. Training and development of the organisation reflecting a priority for safety and environment.

2. Measurement of overall maintenance results – maintenance leadership establishing a set of performance measures and goals that track the functional effectiveness of maintenance and complimentary to the mission of the business being supported. Performance against these goals would be monitored and managed to improve performance.

   A set of performance indices and goals that measure at least the following aspects of maintenance may typically cover the following areas:

   - Labour productivity,
   - Material management effectiveness,
   - Contractor effectiveness,
   - Overhead control,
   - Planning and scheduling effectiveness,
   - Predictive/preventive effectiveness,
   - Reliability engineering effectiveness,
   - Training program effectiveness, and
   - Etc.

3. Commitment for increasing the involvement, effectiveness and productivity of all levels of the organisation, demonstrating the following:

   - Task teams used at all levels with defined objectives and responsibilities,
   - Processes that support employee involvement and solicit feedback, and
   - Authority and accountability for decision making established at the lowest, most effective level.

THE AWARDS

The Industrial Maintenance Roundtable is pleased to offer three levels of recognition: the highly prestigious Premier Award level, recognising leading Australian organisations currently demonstrating best practice across all categories; and two Certificate levels recognising significant progress towards best practice across all categories.

The levels of the awards recognising the 'journey' to achieving maintenance excellence are:

The Premier Award: For achievement of excellence in maintenance contributing to improved business performance.

Finalist: Recognition of achievement as a finalist in The Australian Maintenance Excellence Awards.

Achiever: Recognition of achievement in pursuit of maintenance excellence.