MAINTENANCE OF DISTRIBUTED ASSETS

Mike Levery, MCL Consultancy Ltd

CONTENTS

INTRODUCTION

Improving productive time, reducing overheads, making planned and preventative maintenance effective and reducing breakdown are some of the key issues high on a maintenance managers agenda. The traditional method of improving productivity was to examine work planning and organisation methods to maximise working time. This, however, has its limitations, especially when dealing with a wide geographical distribution and diversity of assets, as can be found in the utility companies.

This paper examines how productivity can be improved and overheads reduced in a company with distributed assets. It includes the establishment of a home based operation, closure of unnecessary depots and workshops, introduction of self management and self directed work teams for craftsmen, and reduction and redirection of first line and middle management.

The experiences of implementing these changes in a water utility company are explained giving guidance on how to tackle the major issues involved in moving to a home based operation. Many of the lessons learned would also apply in any maintenance situation.

REASONS FOR CHANGE

Many company maintenance departments are considered ineffective due to their inability to achieve more than 50% productivity from the craft workforce's available time. Companies with geographically distributed assets achieve even poorer productivity figures as travelling time and provision of spares compounds the problem. In an attempt to improve productive performance, maintenance managers have concentrated on work planning, organisation, and improving planned maintenance to reduce breakdown and unplanned work. Little attention has been paid to the reasons for non-productive time, and the overheads that craftsmen carry in executing their work.

Craft Status

In the 1950's and 1960's, the status of craftsmen was considerably higher than it is today. They generally reported to an electrical or mechanical foreman, who was an engineer in his discipline, and supported the craftsmen on technical matters. Decision-making and prioritising work was left to the craftsmen themselves, and non-productive time was kept to a minimum as each craftsman was provided with a semi-skilled mate who assisted in two man jobs and sourced all materials, enabling the craftsman to concentrate on the task in hand. With the introduction of planned maintenance and bonus schemes in the 1970's and 1980's, the craftsman's mate was not seen as cost effective, and the role of foreman was changed substantially to concentrate on work organisation and planning, and less on providing engineering solutions to problems.

In my experience, the post of foreman or first line manager has been significantly devalued, resulting in personnel with good organisational skills but who lack man management skills and technical expertise, and subsequently lack the respect of the craft workforce. With the technical skills and ability of craftsmen continuing to grow, and higher educational standards being achieved, it is now time to re-evaluate the roles and responsibilities of craftsmen, and move first line management from a directing into a supporting role.

Non-productive Time

When examining non-productive craft time, in any maintenance department, most time is lost at the beginning and end of each working day. Where travelling from depot to site is involved, as much as $1^1/_2$ hours at the start of the day and 1 hour at the end of the day is not uncommon, accounting for almost 30% of available time. Making craftsmen travel directly from home to site, resulting in increased productivity, can reduce this significantly. The maintenance depot has been no more than a meeting place for the workforce, a centre for planning, a vehicle store and an occasionally used workshop, and the number of depots required to support a home based operation can be drastically reduced by running a home based operation. Moving first line management from a directing to a supporting role, and changing roles and responsibilities of middle management can reduce staff overhead by 50%, typically moving the staff to manpower ratio from 1:3 to 1:6.

Technology

Technology has improved voice and data communications available in the field, increasing the options for passing work out to a home based workforce and receiving feedback of completed work, by radio or telephone. It is very tempting to assume that craftsmen can interface directly with the work planning and scheduling system both for receipt of work, and for updating plant history on completion, losing focus on their primary role of carrying out planned and repair maintenance. Systems enabling craftsmen to receive and schedule work can be beneficial, but feedback on completion is best carried out by traditional methods through completion of job cards and inputting by data entry personnel.

MANAGING A HOME-BASED WORKFORCE

Maintenance Structure

To establish a self-managed workforce requires a radical change to the structure of the maintenance section, and a substantial change to the role of first line supervisors.

Establish responsibility for craft training, discipline, vehicle and tools/equipment requirements under one manager, with the objective of providing a motivated, skilled and mobile workforce.

Change the role of the supervisors from directing craftsmen to that of engineers providing a service to the production customer.

Allow the craftsmen to organise the routine planned and repair work, and make the engineers responsible for engineering technical solutions, improving plant performance and planning major outages.

MAINTENANCE MANAGER

- CRAFT SERVICES MANAGER
  - CRAFT
- ENGINEERING MANAGER
  - ENGINEERS

Communications

If just one word can be used which forms the key to an effective home based operation it is that of communication. It is imperative that management communicate regularly and effectively with the workforce, and allow time for ideas and views to be fed back. Continuously update work groups on their performance, and relate it to overall achievement and targets.

Involve the trade unions in the communication exercise as a partner, giving them a deeper understanding of management thinking and plans, without allowing them to be the vehicle for communicating to the workforce. Closure of depots actually reduces the opportunity for trade union representatives to solicit members views on a regular basis, and prevents damaging rumours circulating, giving management greater control through periods of change.

Management visibility by the workforce is also imperative, and managers must set time aside to attend briefing sessions in the field, and present business plans and strategies at employee events.

Work Planning and Organisation

Only plan those jobs that are beyond the management skills of the craftsman, where engineering expertise or production planning is required. Allocate all planned and routine repair work directly into the field for the craftsman to organise, and establish standards of service with the production department, so that craftsmen can prioritise their work schedules. In operating this way, as much as 80% of the planned and repair can be organised by the craft workforce.

Customer Roles and Responsibilities

One of the biggest complaints that production has about maintenance is their failure to respond effectively when needed. Maintenance teams should be established around production managers or processes, and each team should agree the working arrangements for responding to failure. Production must also recognise that not every failure is an emergency, giving scope for the maintenance teams to plan. Provided all the work requested is registered, the craft team can determine who will carry out the work on an ongoing basis.

Ensure that the production function recognise the decision making responsibilities of the craft workforce, and pass routine work approval down to the lowest level in their organisation. There is little point in having a self-managed craft workforce if they cannot make decisions directly with their production counterparts.

Treat production as a customer for day to day maintenance work, but plan major outages for overhauls and planned preventative maintenance, ensuring production make the plant available for the work to be carried out.

Workshops

Large repair jobs are best managed in a workshop environment, and where these facilities are required they should be utilised in full. Establish a workshop team with a working chargehand to overhaul large items of plant, and direct routine refurbishment work out to contract. It is far more cost effective to apply the skill and expertise of the craftsmen to deliver solutions to major repairs in their particular industry than to contract this work out where there is no knowledge of the processes or applications.

Through establishing these arrangements, an engineer's involvement in major repairs can be minimised, once again reducing overheads.

SELF MANAGED CRAFTSMEN

Self-Management

Self-management can apply to many issues in business decision making, but in the case of a home based craft workforce, it refers to the ability of a craftsman to plan and organise his own work in line with productive targets and standards of service as part of a small, customer focused, maintenance team.

Individual Responsibility

With the move to a home based operation, craftsmen will take on responsibility for the vehicle and its contents, reducing significantly vehicle maintenance and repair costs, and tools and equipment replacement costs.

Safety issues assume even greater importance with direct allocation of work, requiring craftsmen to be accountable for safe working procedures and practices, as they must decide when these procedures apply, and where permits to work must be used. Safety inspections must concentrate on ensuring craftsmen are properly equipped for carrying out their job when working from home, and select appropriate jobs to monitor that safety procedures are being properly applied.

Customer Focused Teams

Allow the working teams to set a weekly programme of planned and repair work, facilitated by their supporting engineer, in line with meeting their own productivity and standards of service targets. Ensure monthly feedback of performance information to enable teams to monitor their progress.

The team must establish criteria to determine how work is allocated, to cover such issues as urgency of the job, ongoing work status and travel time. These criteria must be conveyed to the production personnel so they understand the process for allocating work.

With no direct leadership, and the team responsible for delivering against targets, poor performers quickly realise that they must meet the team members aspirations, or they will be exposed. Supervisors used to find work for the poor performers, but with self-directed teams, poor performers are made redundant by the team.

Overtime

Allow the craftsmen to make the decision on whether overtime should be worked on a job-by-job basis dependant on urgency and in discussion with the customer. Do not peak lop with overtime, and only work planned overtime if it is a customer requirement. It is surprising how overtime reduces when the craftsman is tasked with the decision as to whether it should be worked or not.

Materials Supply

Establish mobile ferrymen to supply craftsmen with consumable materials on an ongoing basis, backed up with supplier framework agreements for specialist materials such as seals, bearings, fasteners, electrical components and lubricants. Suppliers must deliver direct to site in line with a craftsmen's work plan, and craftsmen must plan their work to ensure they maximise productive time, and work on other jobs when materials are being sourced.

Tools and Equipment

The temptation with a home-based workforce is to equip the craftsman's vehicle to meet every eventuality. Target the vehicle size to be smaller than what you actually think is needed. In this way, the craftsman will ensure that he carries only what is necessary to carry out day-to-day work. Provide a secure tool vault in the field for each working team to carry a range of tools and equipment not needed for everyday work, but which may be used on say a weekly basis.

Any specialist equipment that is used infrequently should be stored in the workshops and delivered to site when needed.

Pay and Reward

Although the trade union representatives will be looking for financial compensation in line with the added responsibilities of the craft workforce, the craftsmen themselves welcome the opportunity for self-determination, and will not be expecting payment. Once the new working arrangements are proposed, there is willingness by craftsmen to implement them at the earliest opportunity, and pay is not an issue.

FIRST LINE MANAGEMENT

Roles and Responsibilities

In moving to self-managed craft teams, the most vulnerable and threatened working group is that of supervisors. Not only is there a significant reduction in numbers, but also a wholesale change in job description. No longer will they be directing the craft workforce on a day-to-day basis, but will support when requested by the craftsman. Their major role is to plan and organise large jobs, plant outages, and be the engineering expert to a number of customers covering a fixed geographic area.
Change the title of the first line manager's post from supervisor to engineer as the first visible sign of not being directly responsible for the craft workforce.

Customer Focus

Perhaps the most difficult concept to grasp is that the production manager, often regarded as being ignorant of the engineering issues, must now be treated as a customer who requires help and advice to maintain the operational assets in good working order.
Ensure the engineer is focusing on the job and the customer, not the craftsman. The engineer is, in effect, buying craft services from a third party to deliver an agreed programme of work.

Team Working

Encourage team working within the engineering group to make best use of the craft resources available, especially when planning outages and major jobs. Establish the engineering team at one location, remote from the day-to-day activity, and encourage them to pool their skills. This will also force the home based craftsmen to manage and think for themselves, liase with the customer, and work within their teams to solve day to day problems.
When organising the 20% of maintenance work that requires planning due to its size and complexity, use the whole of the craft workforce as an available resource, and not just the team that regularly services the particular installations where the work is required.

Materials and Services

Allow craftsmen to source spares, materials and services through materials buyers to free engineers from this routine task. Engineers can then concentrate on planning spares requirements for large jobs and plant shutdowns. The engineering team can then take an overview of spares requirements on a longer-term basis, to determine best practice at lowest cost.

IMPLEMENTATION

Change on this scale does not happen overnight, or indeed deliver the benefits in the first year. Full realisation of the potential of the new working arrangements will not be achieved for some three years after implementation, and management of expectations is a critical success factor.

Although your ideas may be fairly well developed, seek views on improvement from all employees before announcing proposals for change, and feedback all the suggestions. You will find that the craft workforce will have confirmed your ideas, and they will take on ownership of the new working arrangements. Be prepared for only a few ideas for improvement from the first line managers, which will be the first sign that any change is perceived by them to be a threat.

Establish a pilot to test the practicalities of the new working arrangement, but be prepared to implement in full shortly afterwards. Many of the individual issues raised by craftsmen about home based working are best resolved by them experiencing the new working arrangements, and finding their own solutions.

Be prepared for an initial drop off in performance over the first six months, as the craftsmen get used to the new working arrangements, and the engineers point out how the old way of doing things was the best! Performance will improve rapidly after 12 months operation, at which point the engineers will recognise and accept the benefits of the new working methods. It is at this point that training for the engineering team on coaching and supporting skills, engineering, planning and maintenance improvement techniques should be given. This will allow the engineers to move from a reactive environment to assessing underlying causes of failure, reducing the need for high levels of repair work.

Throughout the implementation period and beyond, brief all employees weekly on relevant issues, and set half-day events every six months to provide updates on business plan progress and performance.

CONCLUDING DISCUSSION

For the last twenty years, companies have sought to increase the skill base of their craftsmen as a result of technological development and through multi-skilling, yet have failed to recognise their organisational capabilities.

Immediate benefits can be realised by moving to a home-based operation for companies with distributed assets, through improved productivity and reduced overheads. On a longer-term basis, moving first line management from a supervisory role to that of supporting engineer creates the time to examine plant performance issues, and determine solutions, which reduce failures, resulting in all employees benefiting from the new working arrangements. Craftsmen take on work organisation responsibilities, and engineers deal with longer-term issues rather than day-to-day operation. The end result is that the maintenance function gains more control over the performance of a company's assets, and becomes a more proactive organisation.