Maintenance—The Key to Production

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ABSTRACT

The keys to improved maintenance and hence to improved production are the result of a combination of greater individual performance and better tools. The Salt Industry maintenance man today must be knowledgeable, motivated, diplomatic and cooperative. The tools he needs to improve maintenance are good equipment and shop facilities, inservice training, establishment of a preventive maintenance program, and sufficient equipment for the production department to allow maintenance.

INTRODUCTION

The Salt Industry, like so many other industries, has failed to attract and motivate good men into maintenance work. The selling job is difficult because younger people do not seem to be as dedicated to their jobs as they were 15–20 years ago. Monetary inducement is not always the answer. In this fast changing world, the younger generation wants more time for recreation and does not want to devote as much time to its work. Wages and benefits are such that they can do this and in addition, wives who work help family income. In turn, since wives supplement part of the income, they do not want their husbands working overtime or on weekends. As a result, selling people on pride on performance alone will not improve maintenance work.

How does one motivate people? Somewhat like a ballteam, there must be a desire to be the best, whether it's preparation work, loading and hauling, or simply watching machinery perform a good job. It must mean knowing that when a machine is released for a job, it will perform this job for x number of hours, it will do better than its competitors, it will do it cheaper than its competitors and it will produce more than its competitors. This means teamwork within the department and also within the entire mine. Competition between shifts in maintenance is difficult because repairs are performed by most mechanics on all machines. Perhaps an isolated case to the contrary would be a large operation with a great deal of equipment where specific units could be broken down into individual maintenance groups.

IMPROVING MAINTENANCE AND PRODUCTION

Where does one start improving maintenance? Perhaps with production. Production schedules measure performance by operating within set budgets and unit costs. When goals are met, there seems to be less pressure and consequently less reason for scrutiny of performance. But production is also measured in output and this is where the rub comes in. When production is marginal there is the tendency to run a machine another hour or patch it up until it can be repaired properly, but by all means let it run. In most cases the hour becomes hours and the temporary job becomes permanent. This may work, as most engineers know, but not for very long. The production department needs it and usually has preference. The maintenance department keeps insisting that it should be serviced and usually is caught between production goals and reasonable maintenance standards.

Some mine operators have given maintenance work priority, and rightfully so, since the production department can only perform with good operating machines. In this way, production schedules are run by the maintenance department, which is responsible for production and must, in turn, have the equipment to operate efficiently. This, too, can be a deterrent, however, because the easy way out is to have an overabundance of machines. There must be cooperation between production and maintenance departments' personnel through communication

and understanding of each others' problems. Little can be accomplished without a plan or program. Preventive maintenance is one of the tools which can be used to alleviate the situation. Production personnel can cooperate by recognizing machine deficiencies and reporting faulty performance. Since both are judged on production, unfortunately, each is reluctant to do a thorough job of reporting and repairing.

PLANNING MAINTENANCE

One method of preventing overstocking machinery is to have sufficient machines so they can be rotated for production use and maintenance time. Management must recognize these requirements, and through a detailed study determine which machines and how many are needed to do an efficient job so proper maintenance can be performed. Sufficient repair parts in inventory are necessary to do the job with the least amount of downtime. Each machine must have a priority which is measured as the basis of production. It is easy to have more equipment than necessary, but to have the number required to run an efficient operation means know-how, vision and the ability to plan ahead.

Maintenance of mining equipment has become so complex and expensive that it must be organized with personnel, planning, records and scheduling to be effective. Organization is the establishment of authority, responsibility and relationships to achieve the desired end results. Maintenance is an influence on production costs, it has an effect on output in relation to operating versus breakdown time, and maintenance must protect and improve capital investments.

Another factor which influences production and maintenance plans is surge capacity. Surge storage is usually built up during hoist downtime or on weekends. Mining operations behind the surge bin would be independent of hoisting since production could be met through surge storage. The size of the surge bin would depend on how much production is needed to offset mining maintenance problems. This can be measured in hours or days of production necessary.

In addition, other factors compound the problems. Manufacturers are making more sophisticated equipment to combat the increasing labor costs and to comply with federal and state safety and health regulations. The mining industry is trying to comply with regulations and the manufacturers are behind schedule because they are experimenting with numerous changes. Consequently machine schedules are behind and the leadtime for new purchases may be as much as 12 months or more. The industry must face the fact that budget allocations for equipment must be made well in advance in order to keep the production and maintenance departments equipped. This means a better look at equipment needs for both long and short range planning.

Management, with the help of the production and maintenance department, must be kept informed of machine deficiencies. The only way the manufacturers of mining equipment can improve their machines is to know exactly what problems are causing the machines to operate below desired standards. In most cases, they welcome constructive criticism regarding defective parts and poor performance so that their engineering staffs can improve the machines. Each operation is different and a revised part for one operation may not work as well for another. However, manufacturers will work with operators to make a better machine.

A majority of maintenance problems can be solved on a 2-shift production operation, where the preventive maintenance is accomplished on the third shift. However, in many union contracts the older and more experienced men are on the first shift because of seniority. The majority of qualified men must be on the preventive maintenance shift in order for it to function efficiently. As a consequence the maintenance department has more machines to repair during the operating shifts. On a 3-shift production operation, the problem becomes more complex because more machines are used. A 3-shift production operation must have some kind of preventive maintenance program and sufficient machines to get maximum performance. A 24-hour operation is extremely hard on equipment and machine efficiency commonly drops sharply. The inventory of parts must be controlled carefully through a record of maintenance performed on each piece of equipment which should be kept to maintain minimum levels.

Computerization has a place in maintenance scheduling, planning and inventories. It can be used to set up a good preventive maintenance program which reduces downtime while waiting on parts, keeps inventories to a minimum, receives, stores and delivers at minimum costs, controls waste better and uses fewer office personnel to process the information.

Proper maintenance can only be performed with facilities and shop equipment to do the job quickly and competently. But by far the biggest asset to the maintenance manager is good employee training and this means in all phases of maintenance. The company can train on the job and can send those interested to manufacturer's maintenance sessions and seminars on particular machines and component systems. These sessions help train and educate key personnel in maintenance techniques. Training helps from a morale standpoint by showing that the company is willing to help in making the men better qualified and by showing that the company thinks enough to better educate the employee for a more responsible job in the future.

SUMMARY

The keys to better maintenance and hence greater production can be summarized in terms of individual performance and proper work environment.

A maintenance man must be—

1. Knowledgeable.
2. Better educated and trained.
3. Motivated.
4. Diplomatic, by being fully cooperative and communicative.

The tools for better maintenance are—

1. Better equipment and shop facilities.
2. An opportunity for employees to attend maintenance sessions.
3. Establishment of preventive maintenance programs.
4. Availability of surge capacities indirectly help maintenance.
5. Sufficient machines such that service is properly done.

Proper maintenance is not an easy job, but it will be a rewarding one. It's the Key to Production and the reward is output at minimum costs.