

Mine management by objectives

by A. A. Hazell

The procedure of setting production targets is illustrated in Appendix I of the paper. This procedure is intended only as a guide although the standards on which it is based were established by work studies and found subsequently to be well within the limits of a trained crew. Within this framework the shift boss makes the basic decisions and sets his own targets using his detailed knowledge of the capabilities of his workers and the general working conditions. In general shift bosses' targets are accepted and any shortfall of the total mine target is made up by increasing the overall number of contractors. In reality this rarely happens. Should a shift boss consistently set low targets it will become necessary for the mine overseer to help him to improve the situation.

The basic decisions to be made in setting the stope production targets have been enumerated in Appendix I. However the shift boss should have the authority to:

- (i) place contractors in suitable stopes so that their full potential can be realized.
- (ii) stop or start contracts.
- (iii) redeploy equipment to suit changed conditions
- (iv) improve methods.

Although output standards are as old as stoping itself it is only when they are viewed within the context of the overall objectives of the mine that they become meaningful. It is more common to find that objectives are set not by a logical process such as the one suggested but rather by a rule of thumb and glance at the previous month's results. Surely targets can only be set in the light of current or anticipated conditions. Furthermore targets well founded on practical observations and standards and derived in a logical manner are more acceptable to the contractor, particularly if he helps to set the target himself. Should the contractor prove unco-operative then the official atti-

tude must be "let us examine your working environment with a view to showing you how the standards can be applied and how the plan will work".

MANAGEMENT TRAINING

Training in management includes the following:

- (i) setting objectives
- (ii) building an organisation
- (iii) measuring results
- (iv) motivating and communicating
- (v) developing people.

The training course should include the study and application of quality standards and safety procedures, etc. These are the tools of the job but they do not produce results by themselves. Results are obtained by practising management i.e. by example, by ability to set objectives, to develop people and by motivation. It is not sufficient to fill in reports correctly, to install tracks on grade, to accept people as they appear to be. Management is the cohesive force that binds all these factors together and produces better than average results out of average people.

It is considered that training should be conducted in the shift boss' usual section i.e. probably where he has been unable to get results before. Here any successes achieved would have a greater impact and lessons learnt would be of greater significance than those experienced in an artificial training school. The training mine overseer must accept legal responsibility for the stopes in question. This method of training has been carried out over many months systematically working through the complement of shift bosses. The biggest problem has been to convince officials that they personally have something to learn. In the lecture method of training one very often sits smugly thinking that the lecture is directed mainly at the others in the class.

The Learner Officials' Course did and still does provide mainly the

basic knowledge and training required by an official. All officials whether or not they completed the Learner Officials' Course should benefit from an intensive management course run by a successful manager. The real benefits, however, will come with practice and it is important that all managers in a company attend such courses. Even then the work environment may be inadequate to sustain the initial enthusiasm.

THE TRAINING MINE OVERSEER

Training is the responsibility of the line executive and the degree of training required by juniors must be taken into account when deciding on the scope of command.

However, objectives become lost and relationships strained under normal production conditions. A training mine overseer, correctly selected, will

- (i) re-establish the correct relationships with his men.
- (ii) concentrate on objectives.
- (iii) obtain results.
- (iv) prove that management is a practice.

The normal mine overseer with his reduced section will be provided with new stimulus to meet the challenge of "being shown up". The ingredients of good management usually exist in a section. It is fresh stimulus, concentration on objectives and the willingness to learn by practice that produces better results.

MANAGEMENT IN THE WORKING ENVIRONMENT

Management in the working environment involves

- (i) accepting responsibility for results
- (ii) expecting the best not the worst from people
- (iii) getting results which enhance the overall objectives of the business
- (iv) working with people to show

them how things should be done and what can be achieved

The skills to be developed are

- (i) setting targets: with the approval of the contractor and to the satisfaction of the mine overseer
- (ii) getting the contractor to execute the plan used in setting the target
- (iii) persuading the contractor to accept labour standards
- (iv) utilizing the abilities of the team so as to achieve the best results
- (v) using one's own initiative to the

full and exploring all possibilities before going to the boss with a complete analysis of the problem

- (vi) the creation of a climate so that people want to work and want to further the objectives of the company.

Colloquium on shaft sinking

A successful colloquium which was attended by approximately 175 people was held on Shaft Sinking on the 15th November, 1972 at Kelvin House. Four papers were presented.

The chairman for the first session was Mr W. W. Malan, Consulting Engineer, Goldfields of South Africa. The first paper "The influence of economics on the design of mine shaft systems" was presented by Mr H. M. Wells, Senior Lecturer in the Department of Mining Engineering, University of the Witwatersrand. He highlighted the various headings in his paper and stressed his reasons for arriving at a quadratic function in expressing total shaft cost in terms of the shaft diameter.

Mr V. O. Steed suggested that instead of spending more on shafts this could be spent on tunnelling and refrigeration, provided the shape of the mining area was suitable. In addition water spraying at and after blasting time could reduce refrigeration requirements. Mr Fuller-Good thought that the acquisition costs of the property should rank as capital expenditure in the designing of a shaft system. Mr D. A. Immelman thought that the D.C.F. rate of return method could be used as effectively in evaluating various shaft designs. In reply Mr Wells explained his reasons for choosing the P.V. ratio in preference to the D.C.F. rate of return method. Dr A. Taute felt sceptical at the thought of working out a mine in less than 20 years if capital expenditure was to be deferred as much as possible. He wondered if the practical life was not closer to 40 years, and asked if it was not better to have a shaft or mill bottleneck until it was definitely certain that the mine was capable of producing the required tonnages.

A contribution, "Raise and shaft

drilling, a continuing development" was presented by Mr Richard J. Robbins, President, The Robbins Company of Seattle, Portland, U.S.A., who illustrated with slides certain raise borers planned for the future. A film was shown of the 81 R Raise Drill, the most powerful built to date, in use on a 12 ft. diameter shaft at Hecla's Lakeshore property, Arizona.

The second session was chaired by Mr M. Barcza, Managing Director, Corner House Laboratories. During this session two papers were presented. The first, "A review of some aspects of shaft design" was presented by the authors Mr G. W. Holl and Mr E. G. Fairon, Managing Director and General Manager, Mining and Engineering Technical Services (Pty) Ltd. Slides were shown on the sinking of the twin shafts of the Cleveland Potash Mine, Yorkshire, and a shaft at a mine in Bolivia. The second paper "Design features of a deep level shaft" by Mr D. H. Hillhouse, Consulting Mechanical and Electrical Engineer, O.F.S. Mines, Anglo American Corporation, and Mr G. Lange, General Manager, President Steyn Gold Mining Company, was presented by the latter author who discussed some of the design features of the new No. 4 Shaft, President Steyn, from which mining will take place to a depth of 2 300 metres, below which inclines will be used.

A lively discussion on the papers presented up to this stage ensued, with several contributions from the floor. The merit of choosing between an incline shaft and a vertical shaft was discussed, and the question of whether the ventilation requirements or the hoisting capacity had a greater influence on the ultimate shaft size was debated.

After lunch, the session chairman Mr G. H. Grange, Technical Adviser, Chamber of Mines, introduced Mr M. H. Thompson, Goldfields-Cementation Co. Ltd., who presented his paper "Some aspects of shaft sinking techniques and shaft sinking contracts". Mr Thompson stated that years had elapsed without any major change in shaft sinking techniques and felt that a careful study was necessary to decide whether shaft drilling equipment should be introduced. The drilling and blasting cycle was the most expensive item in shaft sinking and some sort of drilling rig would have to be developed. The blowing over regulations were also very stringent and could possibly be relaxed with the introduction of impact-free explosives. He suggested improvements to tendering documents which he felt were loaded against the contractor; thought that the introduction of an arbitration clause could help in solving disputes; and that more attention should be given to specifications in shaft sinking contracts.

Mr J. J. Geldenhuis read a contribution by Mr P. M. Johnston who thought that improvements were required to the contract documents, and felt that contractors could best be used in sinking the first shafts on a property. Mr O. F. Rheeder suggested that there was scope for using a raise borer and then slipping to the final size. Mr A. N. Brown stressed the need for the more accurate drilling of holes and the possibility of using shaped explosives was raised.

The colloquium chairman Dr A. Taute, Technical Director, Goldfields, summed up the days proceedings. He felt that it was obvious that both ventilation and hoisting capacity largely governed the size of shaft,