Mining Science and Technology, 9 (1989) 227–236
Elsevier Science Publishers B.V., Amsterdam – Printed in The Netherlands

Reducing coal miner absenteeism

R.H. PETERS and M.R. CLINGAN

Pittsburgh Research Center, Bureau of Mines, P.O. Box 18070, Pittsburgh, PA 15236-0070 (U.S.A.)

(Received December 15, 1988; accepted March 14, 1989)

Abstract

Peters, R.H. and Clingan, M.R., 1989. Reducing coal miner absenteeism. Min. Sci. Technol., 9: 227–236.

High absenteeism at coal mines can seriously affect safety and hamper productivity. Several effective strategies for achieving high attendance which mine operators may not have considered are presented and a method is proposed for implementing programs for minimizing absenteeism among coal miners. The best strategies for improving attendance will vary according to the needs and circumstances of the particular mine, however, the process for establishing such a program is relatively invariant. A four-stage process is recommended: evaluate data from prior attendance records, communicate attendance goals and policy, develop and implement an attendance promotion program, and recycle.

Introduction

There is substantial evidence to suggest that absenteeism is a significant hindrance to mine safety and efficiency [1–5]. Underground coal miners work in a relatively hazardous environment, and the jobs they perform are relatively interdependent; the entire production process can be stopped if any of several critical activities are not performed properly. When members of underground coal mining crews are absent, either someone is assigned to fill in or the crew will work without a replacement. In either case, production and safety problems become more likely. Temporary replacements may be unfamiliar with the habits of the people who work in the crew, the physical conditions, and the equipment. Consequently, replacement workers often do things (or fail to do things) that can reduce productivity and contribute to accidents. In describing the processes by which absenteeism influences productivity Adkins [1] notes the following: "First of all absent workers simply do not produce much coal. In more indirect paths one can see that absenteeism can both increase safety problems and decrease the general skill level of the crews. Deteriorating skill levels lower production and increase maintenance and down-time problems. Absenteeism leads to labor/management relations problems, frequently arising from attempts to discipline absent workers, which in turn lowers the productivity of both labor and management."

There is almost no empirical evidence concerning the effectiveness of interventions that might reduce miner absenteeism. However, a substantial amount of research has been conducted to determine the effectiveness of various strategies which have been used to reduce absenteeism in nonmining industries. Based on this evidence and what is known about absenteeism in the underground coal mining

0167-9031/89/$03.50

industry, some guidelines concerning the development and implementation of programs to improve miner attendance are proposed. The paper also provides advice concerning the selection of appropriate replacement workers for missing crew members.

Program for improving miner attendance

An attendance program which produces high and predictable attendance can reduce interruptions to production, decrease labor costs, and improve safety. If attendance is not perfect but safety and productivity are high, then the goals may be considered met. Furthermore, employee satisfaction is an important goal in its own right. A program that achieves excellent attendance at the cost of lowered employee satisfaction may alienate employees, causing a variety of undesirable outcomes. The program should help foster effective work habits and positive work attitudes because such habits and attitudes are crucial determinants of the productivity and safety of a mine operation. On the basis of the research evidence concerning characteristics of effective absence control measures, the program shown in Fig. 1 is recommended.

Stage one—evaluate attendance data

The first stage involves collecting and analyzing data on absenteeism. This is a very important prerequisite to the other stages. The data can reveal whether the problem is with a few individuals, is mine-wide, or if the problem is restricted to a particular section, shift, or unique subpopulation of employees.

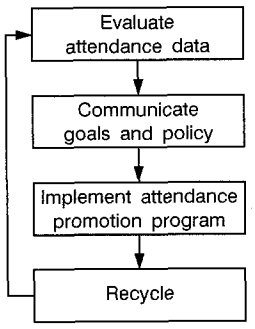

Fig. 1. Four-stage program for improving miner attendance.

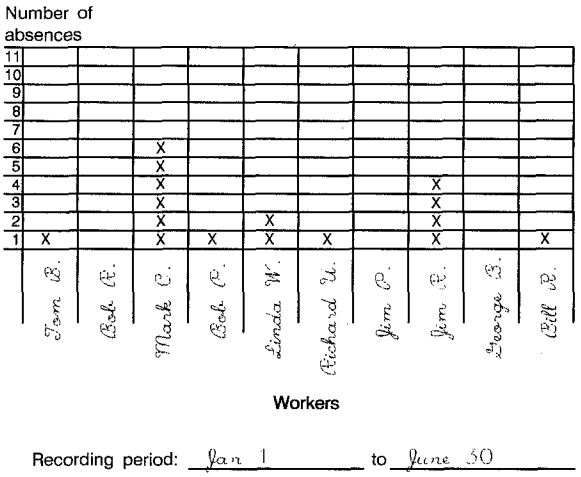

Fig. 2. Cases of absences recorded over a 6-month period for members of a hypothetical mining crew.

There are a number of useful means of examining the data, each having strengths and limitations. For example, the data may be broken into excused versus unexcused absences. It may also be informative to look for seasonal or temporal trends in the data, e.g., breakdowns by day of the week, or other significant events such as the opening of the hunting season. A graphic representation of the data across time also allows one to see if new attendance control measures are having any impact.

Individual level charts. A simple, but effective mode of examining absences is to create a chart that displays the absences per employee per crew. Figure 2 shows a hypothetical example. A tally of this sort may be updated daily by simply placing an "X" above any employee who is absent during that recording period. Each employee's chart should be updated daily as the absence occurs. As the "X's" accumulate, patterns may become evident that reveal problems needing prompt remedial action. For instance, one would in-

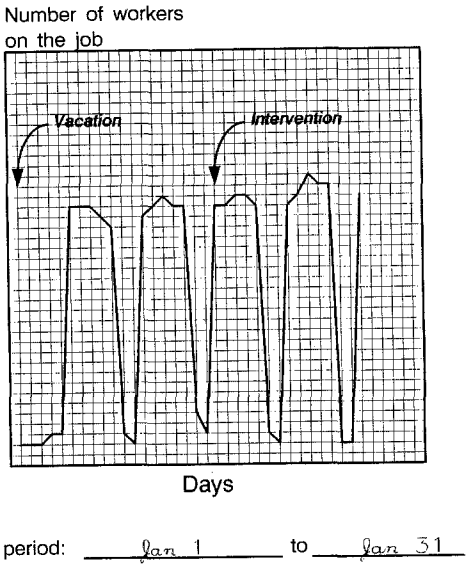

Fig. 3. Attendance chart for a hypothetical 1-month period with significant events indicated.

terpret the situation differently if the pattern seen in Fig. 2 occurred by March rather than by June.

An absence pattern such as that shown in Fig. 2 might lead one to suspect that one or two employees have an absence problem and that the work section is otherwise relatively conducive to good attendance. Another configuration of data (e.g., showing absenteeism in a crew to be uniformly high) might prompt a search for problems beyond the individual employee–perhaps with the working conditions in a particular section or with the immediate supervisor.

Group level charts. Another chart that can be very helpful in assessing the effectiveness of a program is a size of workforce chart. Figure 3 shows a hypothetical example. The horizontal axis is labelled with successive calendar days (for easy analysis, use all of the days of the week even if work is done only on weekdays). The vertical axis should indicate the number of workers on the job. To fill out the chart, calculate the total attendance for that day and put a dot at the appropriate place. This chart can be used mine-wide, by shift or by section depending upon the aspect of attendance that is important. As with the worker absence chart, charting on a daily basis is easier and more effective than tallying a number of days all at once, while furthermore the information obtained as the data is charted can be used to more quickly recognize and correct any impending problems.

A pointer may be placed over important events or significant changes in the attendance program. A relation between these events and changes in attendance may then become apparent. A graph of about 6 months can show how well a program is working and may yield information about the nature of the absenteeism problem, such as time periods of low attendance. Similar charts might also be prepared for each different employee job classification. Information of this type might be useful for anticipating the shortages of various types of manpower. As the attendance program progresses through the other stages, measurement and analysis continues as an integral part of the entire program.

Determining the major causes of absenteeism. Peters and Randolph [3] propose that at the most basic level, miner absenteeism stems from either a lack of ability or a lack of motivation or some combination of the two. They list a number of potentially important determinants of miners ability and motivation to attend work. The factors thought to influence their ability to attend work are: physical health problems, mental health problems, occupational accidents, and transportation problems. The factors thought to influence miners motivation to attend work are: overall job satisfaction, satisfaction with time for social activities, job involvement, perceptions of inequitable treatment, absence control system permissiveness, desire to avoid income loss, attendance norms, and personal values. (See [2] and [3] for more information concerning these factors and the nature of the empirical evidence concerning their association with rates of attendance.)

Goodman's [2] research suggests that the major determinants of absenteeism vary significantly from one group of miners to another. Therefore, the best strategies for reducing absenteeism vary with the causes of the absenteeism. For example, the absenteeism at some mines may largely be due to factors which cause employees to be unable to attend, and that are largely beyond the employee's ability to control (e.g., bad weather). If one attempts to increase attendance at such mines through programs designed to increase attendance motivation, one's effort are unlikely to have much impact. Thus, it is important to choose strategies that fit the major causes.

As discussed previously, one way to assess the relative importance of various potential causes of absenteeism is by analyzing existing data on attendance from mine records. It is important to consider both the frequency and duration of each individual's absences. Infrequent absences of long duration suggest that the employee's absenteeism reflects a lack of ability to attend work, such as illness or injury. Frequent absences of short duration (i.e., 1–2 days) suggest that the absenteeism is more a reflection of factors influencing the miner's motivation to attend.

Another way to determine the major factors influencing attendance is by conducting interviews with miners and mine managers. Structured interviews are a good method for obtaining employees' views about what types of factors cause miners to be absent. (See [2] for a list of useful interview questions.)

Stage two—communicate goals and policy

The formation of goals and policy statements is the next essential stage in the attendance program. It is important to tell employees what is happening for ethical reasons and to avoid conflicts owing to lack of information. Employees will accept changes more readily if they are informed of the changes *before* they occur and the mere act of informing the employees of the rules can result in better attendance. The outcome of this stage is a policy statement that identifies the attendance goals and the policies concerning absences.

The importance of setting goals for attendance cannot be overstated. Before attempting to solve any problems, decide upon what success will signify. The goal should be beneficial to both the mine and the employees, and it should be reasonable, i.e., the aim should be for modest gains—those that are likely to be perceived as attainable. If the goals are easy to attain, then the chances of success are enhanced and the entire work force is less likely to become disenchanted with the program.

At this point, management may wish to involve supervisors and labor by establishing a committee with representatives from both groups. Input from various segments of the work force can be very useful in establishing goals. This committee can also help oversee the program as it is developed, implemented, and evaluated. The committee can be useful in representing the needs of the employees and in keeping them informed of the company goals. This can be a useful aid in securing employee acceptance and compliance to rules or procedures. Research by Scheflen et al. [6] suggests that greater employee involvement in designing an absenteeism policy increases employees' motivation to accept the terms of the policy. If the policy is seen as their own construction, employees will more likely comply with the rules.

The first step in establishing an attendance goal is to describe why absenteeism is a problem. In other words, state the reason the company needs to increase attendance and/or the predictability of attendance. The next step is to state the level of attendance that will be considered exemplary. The relevant measure for attendance will be selected according to the stated goal. It might be the rate of atten-

dance per day, rate per week, absences per employee, or whatever measure is most applicable. Remember that it is important for the goal to be reasonable and beneficial for both the company and the miners.

Part of the policy statement will state what, if any, negative sanctions will be used in the program. Arvey and Jones [9] note that the use of disciplinary actions can sometimes produce undesirable behavior such as increased use of sick time, vandalism, and lower productivity. In order to minimize such negative outcomes for the organization, it is important to establish a clear policy concerning the use of negative sanctions. When punitive measures must be used, they should be applied fairly and consistently. Employees should be informed of the specific behavior which is not acceptable and the sanctions that will follow. The more information the miners have about the program the better informed they will be about the consequences of their actions.

In summary, stating the goals and policies precisely and clearly is essential. It should be done even if there are currently no major absenteeism problems. Employees will know what is expected, and should problems arise, management will have recourse to act in a remedial manner. All employees should periodically be made aware of the policy statement. Specifically, it should explain what absences are excusable, what absences are not excusable, procedures for reporting off, and the consequences of violating the rules.

Stage three—implement attendance promotion program

In this stage various strategies for improving attendance are evaluated, and the ones deemed most likely to work are implemented. Strategies for improving attendance at a particular mine should be chosen on the basis of (1) the extent to which they address the major causes of the absenteeism among that group of miners, and (2) the extent to which they are feasible given characteristics of the company and the work force. Although a significant proportion of miner absenteeism is caused by inability to attend, mine managers are limited in what they can do to overcome this type of problem. Mine managers can probably do more to reduce absenteeism by concentrating on strategies for increasing the level of motivation. Therefore, this paper focuses primarily on two approaches for increasing attendance motivation: (1) supervisory interventions and (2) incentive programs.

Supervisory interventions

In order to help eliminate aberrant absenteeism immediate supervisors could (1) publicly chart attendance, (2) treat absent employees in a just and reasonable manner, and (3) refer habitually absent employees for help if it appears that their poor attendance may be caused by off-the-job problems. The supervisor is the first line of defense against problem absenteeism. In order to perform these actions correctly, supervisory training and feedback on carrying out these procedures is essential.

Publicly chart attendance. Several studies have shown that publicly posting attendance information significantly decreases absenteeism [7]. At one company, supervisors were asked to place a red dot above the name of each employee who was absent, and a blue dot above the name of each person who was on the job. Attendance rose from 86% at baseline to an average 94.3% for the following 9-week period. This program cost less than $10 to implement.

The charts should be filled out daily and publicly posted where the crew can easily see them. Such charts help individuals to see where they are with respect to company goals and/or the attainment of rewards. Employees must be informed that these charts are *not* indices of unexcused absenteeism. Figure 4 shows a chart that is easily filled out on a

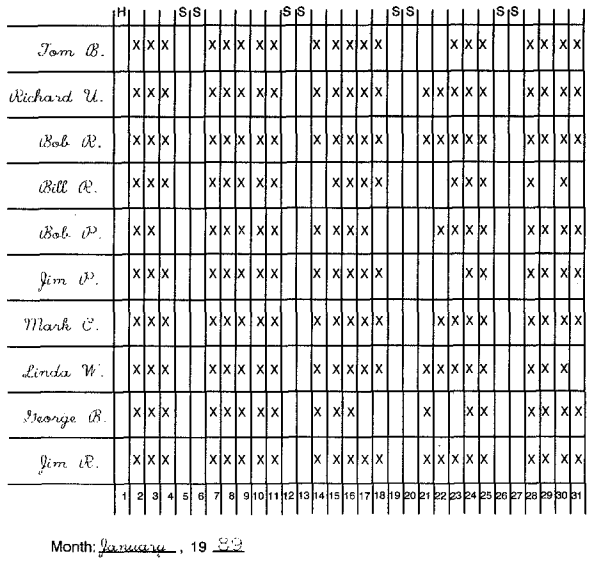

Fig. 4. Chart showing daily attendance recording for a hypothetical mine crew during a 1-month period.

daily basis. The supervisor simply puts a mark adjacent to the name of the employee on the days worked.

While more than 1 month may be displayed at a time, each chart produced by a supervisor should probably contain 1 month of attendance data. Supervisors should consistently record attendance each day on the public chart. This is one of the easiest interventions, involving only minor changes to existing procedures. It can also enhance the effectiveness of other interventions and is therefore one of the first considerations in an attendance promotion program.

Treat employees in a just and reasonable manner. The second type of supervisory intervention consists of emphasizing to supervisors the importance of treating absent employees in a just and reasonable manner, and providing advice on how to do so. Supervisors should not attempt to punish the employee by word or deed. Every negative sanction should already be clearly stated in the policy statement drawn up in stage two. Attempts by supervisors to deliver punishments outside of the formal sanctions in this policy can have negative consequences and might lead to a more intractable absenteeism problem. However, communicating policy to the employee is vital. Supervisors must know how to warn of impending negative sanctions without the warning itself seeming like a punishment. One way to do this is to incorporate the warning into an expression of concern for the employee's welfare. This is a delicate point. The supervisor could appear to be threatening the employee when it is important that he should be seen as giving information to help the employee to do well.

When the employee returns after an absence, the supervisor should first welcome the person back. Informative feedback should be given at a time when the employee will be more receptive to this type of communication. Advise supervisors to give feedback before a negative sanction is applied, but not when the person first returns to work and not in the potentially embarrassing presence of fellow crew members.

Refer employees with off-the-job problems for help. The third type of supervisory intervention consists of training supervisors to recognize miners who have off-the-job problems that may be causing poor attendance. Often, a supervisor is confronted with a relatively small number of habitually absent miners who are experiencing some type of off-the-job problems. Their absenteeism may be the result of alcoholism, drug abuse, emotional distress, or family-related problems. In such cases, it may be helpful to both the employer and the employee if the individual gets appropriate counseling or some other type of assistance to help him cope with the problem. Many agencies offering employee assistance programs, will provide training workshops on how to identify and refer employees with problems.

Positive incentives

If a problem still exists, as indicated by the ongoing attendance recording activity, the

next step is to implement a positive incentive program. Positive incentive programs provide some reward or privilege for high attendance, and may help employees to adopt the attendance goals. Steers and Rhodes' [8] review of research on these programs indicates that the majority of studies of positive incentive programs report significant increases in attendance.

Many absenteeism control plans are based primarily on the use of negative sanctions. These plans usually specify levels of absenteeism permitted, penalties, and attendance rates needed to avoid the disciplinary condition. When properly administered, such programs generally reduce absenteeism. However, as noted earlier, the use of disciplinary procedures can cause employees to behave in ways that are very disruptive and costly to the organization. Therefore it is recommended that efforts to increase attendance be centered around the use of positive incentives rather than the increased use of punitive measures.

When designing a positive incentive program for attendance it is important to consider each of the following issues: (1) establishing a criterion for success, (2) size and timing of the rewards, (3) the type of rewards, and (4) treatment of vacation and sick days.

Establishing a criterion for success. Employees must have specific information on what will earn reward. It is in the best interest of the company and the employee not to make this criterion too difficult. For example, if employees are encouraged to attend work when they are actually sick, they may become more ill or help spread the illness among the healthy part of the work force. Making the criterion for success too high can cause the program to be less effective.

One method for setting the criterion for an incentive system is to first establish a baseline by looking at days on the job over the preceding month or over the same time period 1 year ago. Then, set a criterion that can be reached by most of the employees but which

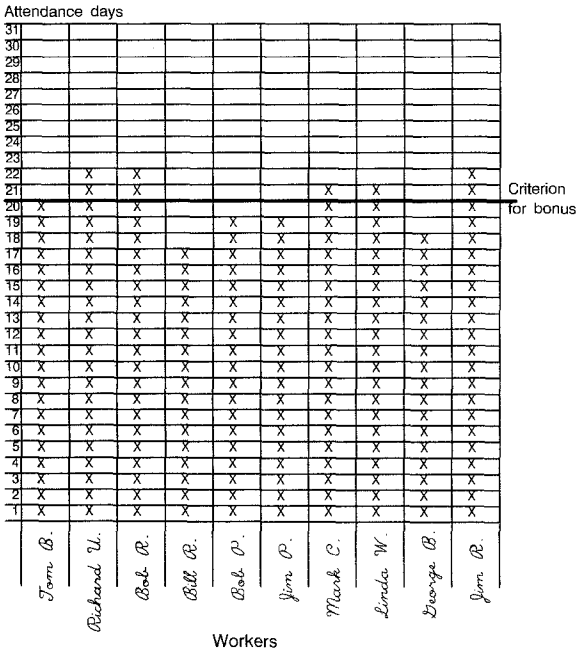

Fig. 5. Attendance tally chart showing criterion for bonus.

is slightly above the average number of attendance days in the baseline period.

The chart in Fig. 5 has no data on the specific days an employee is on the job. The supervisor simply puts an "X" over the employee's name if present that day. A criterion line is present to show if an employee achieves the goal for that month. By looking at the chart on any day an employee can see how close he or she is to the goal.

Size and timing of the rewards. Much research has shown that small rewards given frequently have more effect than large rewards given after a long period of time [10,11]. This suggests that giving a small reward, such as five dollars every month for not missing more than one day is better than giving fifty dollars for perfect attendance over a year. In a positive incentive program, the criterion for success should be within reach and the rewards for success should be given promptly. For example, consider a program which

requires perfect attendance for 6 months in order to obtain a reward. How much impact is that program going to have on a person who misses work the second day of the six month period? Furthermore, this program will only have an impact on the few employees who already exhibit good attendance, and not on the general population of miners. A better program will have an effect on a wider range of employees.

A good way to administer a positive incentive system is by granting a reward or privilege each month for the previous 1 month of attendance. This somewhat short time span increases an employee's opportunities to succeed and it encourages good attendance at the start of each new month.

Giving rewards every day as the miner comes to work is not usually possible. But, some sort of indicator of progress toward the reward can be given on a daily basis. This is one of the reasons the charts and graphs described above are of such importance. Every time a person comes to work a mark is placed above one's name and the progress toward the attendance goal that will earn a reward can be seen. This helps to bridge the gap in time between behavior and the receipt of rewards. The public display of attendance data can be a valuable aid to miners interested in meeting the established goal.

Type of rewards. The type of reward used in the program will have a large impact on the outcome of the program. Rewards or privileges will work best if they are considered small tokens of appreciation for outstanding performance. Rewards need to be chosen carefully so that they do, in fact, motivate. Here are three reasons why a particular reward may not motivate good attendance. (1) Some employees may deride others who earn more rewards, causing a loss of desire for the rewards. (2) Some miners may view the reward as a meaningless gratuity. A particular employee may just not value a reward even though others do. (3) After a person earns a particular reward, one may be satiated with that object and no longer desire it (e.g., if a person is not a collector, one can only use so many belt buckles).

Incentives offered to employees for various achievements range from small novelties through commendations, certificates and stock in the company. Although all of these may be used as rewards in positive incentive programs, privileges may keep motivating better over time because satiation is not as much of a problem (e.g., while belt buckles may accumulate to surplus, the privilege of having an extra half hour of lunch is always in demand).

How might some of these privileges operate? One might, for instance, give an employee paid time off at preferred times to reinforce good attendance. Indeed, Goodman's study [2] suggests that most U.S. coal miners place a high value on paid time off. The question might arise, why should one give an employee time off when that is what the program is trying to discourage? The answer is the purpose of the program is not merely to have higher attendance, but to have more *predictable* attendance. When absences can be planned for they are not as disruptive.

Days when absences are liable to be high (e.g., sports seasons or holiday seasons) may be designated as bonus days for exemplary attendance rates at other times of the year. Similarly, extended vacation periods or the right to leave work early, where feasible, can have a positive impact on attendance behavior.

Finally, since everyone has different values and needs, miners might choose from a personal "incentive menu". Points might be earned and later exchanged for money or any number of other things according to the miner's own particular desires.

Treatment of vacation and sick days. Vacation days must be treated carefully when implementing a positive incentive program. Taking these days is certainly the miners right,

but a last-minute decision to take a vacation day can be as disruptive as an unanticipated absence. To reduce this problem, a time requirement for requesting vacation days can be established. Vacation days, if requested a specified period of time in advance, might be treated the same as a day on the job for the purposes of the incentive plan. Using this method, a vacation day not requested a sufficient time in advance would not count toward the good attendance bonus, although it could still officially be considered an excused absence. In contrast, an absence due to an illness would also be considered an excused absence, but days missed due to illness would not be counted toward achieving the attendance bonus. This system would allow for vacation days, while keeping the integrity of the attendance incentive plan intact.

Several additional strategies for improving miner attendance are discussed in [12].

Stage four—recycle

The last stage in this program is to recycle, i.e., to return through stages 1, 2 and 3 to see if anything can be improved. Take an in-depth look at the entire program, i.e., attendance data, goals, policies, views of employees and supervisors, etc. If an absenteeism committee was formed, it should be involved in this recycling and evaluation process.

It is impossible to know all of the ramifications of a new program *a priori*. If attendance goals are not being met or if unexpected counterproductive behaviors have emerged, then changes need to be made. If attendance goals are being met it is important to let employees and supervisors know this, and to remind the supervisory staff of the importance of continuing to administer the program consistently.

It is especially important to determine if supervisors are administering the program properly. If supervisors are not following the program then consider setting up a system to monitor their behavior and reward them for remaining with the plan. Also consider the following: Can anything be done to make it easier for supervisors to collect and display the data? Is the program working with some crews and not with others? Are some supervisors using useful techniques that might be adopted by others?

The program should be recycled on a regular basis. If anomalies start to appear in the daily recording and display of data then the program should be recycled to avert a possible problem. About three months after any change to the program, recycle to see the effects. Even if it appears to be working as planned, one should still recycle on an annual basis. This will ensure that gains are maintained and that the program is working as well as possible. This stage is important since it will help the attendance promotion program evolve to fit the particular needs of specific sites.

Replacing missing crew members

Because a certain amount of absenteeism is inevitable, it is important that mine managers be prepared to find good replacements for missing crew members. Research by Goodman and Garber [5] suggests that having a plan for finding good replacement workers can significantly reduce the problems associated with absenteeism. Goodman and Garber's analysis of the effects of absenteeism at five large underground coal mines suggests that many of the problems associated with absenteeism appear to stem from the replacement workers' lack of familiarity with the work habits of the miners in a different crew and lack of familiarity with the equipment and physical conditions. Goodman and Garber therefore suggest doing two things to increase the replacement worker's level of familiarity: (1) organize pools of replacement workers, and (2) give special on-

the-job training to replacements and to the adjacent worker (e.g., equipment operators and their helpers) before work begins in order to help familiarize each miner with the partner's work habits. Pools of replacement workers could be organized by job categories. For example, certain replacements would work as miner helpers, others as car operators. The pool could be further organized by mine sections; i.e., when possible, certain workers would always be assigned to the mine sections with which they are most familiar.

Conclusion

Historical evidence indicates that absenteeism typically rises and falls with fluctuations in the level of miner unemployment, and that mine managers have not been very successful at controlling absenteeism during periods of low to moderate unemployment. Although in certain countries (e.g., the United States) high absenteeism among miners is not as widespread today as it was a few years ago it still exists at some mines, and will continue from time to time until mine managers learn better methods for controlling it. It is hoped that the information presented in this paper will cause mine managers to discard the notion that absenteeism is beyond their ability to control.

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