A STUDY OF THE APPLICATIONS OF
GAINSHARING INCENTIVE PLANS IN THE
CANADIAN MINING INDUSTRY

by

DOUGLAS JOHN McDonald

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Department of Mining and Mineral Process Engineering

The University of British Columbia
Vancouver, Canada

Date October 5/1993
ABSTRACT

Increased competition in the mining industry has demanded that companies focus on their operations to minimize the costs of production. While there are many strategies being used to lower costs, employee incentives that attempt to tap the human resources are becoming more prevalent. This research focuses on the applications of one of these human resources incentives in the mining industry: Gainsharing.

In the mining context, gainsharing combines a group based bonus system that covers virtually all employees and is based on parameters over which they have control, with an appropriate communication network and management structure.

The mining environment is conducive to gainsharing plans; in deed, gainsharing has many advantages over more commonly used incentives like piece-rate production bonuses and profit sharing plans. Currently, five percent of the operating mines in Canada use gainsharing plans, while six percent use profit sharing plans and 30% use piece-rate incentives. Surveys returned from five Canadian mines and two U.S. mines with gainsharing plans indicate that in all cases there were increases in productivity, and in all cases the mines are satisfied with the plans.

However, despite the positive results, in some cases the plans are not structured and implemented in the way dictated by both experience with the plans in other industries and the characteristics of the mining industry. After thoroughly explaining the gainsharing concept and exploring the structure and results of the plans used at the mines participating in the survey, this research provides recommendations which will improve the effectiveness of gainsharing applications in mines.
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"Imagine, I ought to have said to him, that you have the same system as the old peasant has, that you have found means of making your laborers take an interest in the success of the work, and have found the happy mean in the way of improvements which they will admit, and you will, without exhausting the soil, get twice or three times the yield you got before. Divide it in halves, give half as the share of labor, the surplus left you will be greater, and the share of labor will be greater too. And to do this one must lower the standard of husbandry and interest the laborers in its success. How to do this? - that's a matter of detail; but undoubtedly it can be done."

Leo Tolstoy, Anna Karenina
1876
CHAPTER 1 - INTRODUCTION

1.1 INTRODUCTION

The Canadian mining industry has been confronted with a vastly changed competitive environment lately. Most of these changes in the environment have been external ones, as countries in South America, the South Pacific, and the former U.S.S.R. have been increasing the competitive pressure on the world's metal markets. Huge high-grade deposits combined with more stable governments and favourable operating conditions have spurred on mine development in some of these countries, while in others the need for foreign currency has lead to very competitive pricing practices. Other changes affecting the Canadian mining industry have been internal. For example, escalating operating costs, due in part to taxation on power, water, and electricity (Keevil, 1993), and increasingly stringent and uncertain land-use policies which can delay and halt potential mines have made an already risky investment even riskier. Traditionally, one advantage Canada has had over many other mining nations has been a stable, predictable political system. However, political advantages of operating in Canada are greatly diminished when the environmental review process can delay projects for several years and the government talks about the validity of expropriation of mineral rights without compensation, as the B.C. provincial government did in early 1992. The net result of these changes has been an increase in global competitiveness, as witnessed by decreased commodity prices, combined with a decrease in the ability of Canadian mines to compete.

As a result of this threat, many Canadian mines are beginning to focus on their operations to exploit all of their resources to the fullest capacity. One potential resource that has been largely overlooked in the past is the human resource. A recent Human Resource Study of the Canadian Mining Industry commissioned by Employment and Immigration
Canada (April, 1992) reports that while a lot of current operations and production workers are not highly educated, most are able to "grasp concepts and learn their job". Furthermore, it states that many operations are requiring grade 12 education for new hires, and others are going further and examining potential employees. This labour base could provide mines with a large competitive advantage, and more and more mines are recognizing this opportunity.

After years of encouraging individualistic performance, some operations are adopting incentives that promote continuous improvement, co-operation, and team competitiveness in the interests of improving productivity. It is hoped that these strategies are successful. A recent study (World Economic Forum, 1991) in which the World Economic Forum compared 23 of the world's developed nations, found Canada to be 16th in terms of the extent to which labour employees strongly identify with company objectives, 19th in terms of the extent to which union and management work together to their mutual benefit, and 20th in terms of the effectiveness of in-company training programs in meeting the needs of a competitive economy (which ranks Canada ahead of the U.K., Hungary, and Turkey).

This research will analyse in depth one type of incentive plan that is being used in mines to tap the human resource: Gainsharing. Conversations with mining human resource professionals and a review of the literature revealed that despite substantial interest in this subject, there is a significant lack of clarity regarding the term "gainsharing". In some of the monographs the plans are described as primarily a participative management scheme which shares rewards from gains with employees, while in others they are purely group-based monetary incentives. Possibly as a result of this lack of clarity in the gainsharing definition, there has been very little research into the application of these plans in Canadian industry and no comprehensive review of their applications in the Canadian mining industry. Richardson (1985) described the life-cycles of four participative management plans, one of which was a gainsharing plan in a mining company, and while insightful, his paper does not provide a clear definition of gainsharing or explore the concept in any detail. By first clearly defining the
gainsharing concept, this research will enable a review of the application of these incentives in other industries which in turn will help when studying the applications of gainsharing in the Canadian mining industry.

The main thrusts of this research are to define the gainsharing concept, outline plan design considerations, summarize recommended implementation and maintenance considerations based on experience with the plans in other industries, explore the potentialities of gainsharing as a corporate strategy, define gainsharing in the mining context, explore any advantages that incentives like gainsharing may have over other common incentives in mining, create a database of the Canadian mines using gainsharing, discuss their plan structures and results based on a survey sent to these mines, and recommend design and maintenance procedures for gainsharing plans in the mining industry.

1.2 MOTIVATIONAL THEORIES

It seems logical to precede a discussion of incentive plans by introducing some theories on motivation. After all, motivation is the incentive's *raison d'être*. This section will introduce two popular theories of motivation, which will provide a basis for understanding human motivation and create a framework which will help to reveal some advantages gainsharing has as an incentive plan. The theories are Herzberg's Two-Factor Theory, and Maslow's Hierarchy of Needs.

1.2.1 Herzberg's Two-Factor Theory

In the 1959 book "The Motivation To Work", Herzberg developed a two-factor theory of motivation. The theory states that the characteristics of each job can be divided into
hygiene factors and motivators. Hygiene factors are analogous to medical hygiene, as they are not curative, or don't motivate, but they are preventative measure against "disease". In other words, they result in dis-satisfaction amongst employees if they are not present, but do not motivate if they are present. They include such things as adequate salary, job security, working conditions, benefits, company policies, and technical supervision. Motivators, on the other hand, result in satisfaction and motivation when they are present in the job, but do not necessarily result in dis-satisfaction if absent, as long as the hygiene factors exist. They include things like achievement, recognition, responsibility, advancement, the work itself, and the possibility for growth. According to this theory, a motivated work force will have the hygiene factors present, and will also have a suitable number of motivators present. Moreover, Herzberg states that the jobs with few opportunities for the motivators to appear must offer a higher level of hygiene factors, to make the work tolerable.

![Diagram of Herzberg's Two-Factor Theory of Motivation]

It is important to note that as employees change, so do the conditions which act as motivators or hygiene factors for them. For example, fifty years ago pension plans would have been considered motivators by most employees, and would have encouraged job
satisfaction if present. Today, however, people are dis-satisfied if pension plans are not present, or are insufficient. One example of a condition that is a motivator today but may become a hygiene factor in the future, is daycare (Doyle and Doyle, 1992).

1.2.2 Maslow's Hierarchy of Needs

Maslow's hierarchy of needs include, in order of importance, physiological needs, safety and security needs, belonging, social, and love needs, self-esteem needs, and self-actualization needs. The theory is that people have a "need hierarchy", and that when one level is satisfied people's efforts shift to fulfill the next need in the hierarchy, and it is the pursuit of this need that will motivate them.

![Maslow's Hierarchy of Needs](image)

Physiological needs include the need for food, shelter, and health, and represent the most basic human needs. If these needs are absent, people are very highly motivated to achieve them. Once achieved, people are motivated to fulfill their level two, or safety and security needs. Fulfilling level two needs will imply that the needs for food, shelter, and
health (i.e., level one needs) are secured for the future. Once people know that their safety and security needs are met, they are motivated to fulfill their level three, or social, needs. These can be met by family, or through work, religion, or other social groups. Often, when companies do not satisfy these needs, union membership does (Doyle and Doyle, 1992). The terms union, and brotherhood, and slogans like "workers of the world, unite" connote level three needs. Once these needs are met, people are motivated by the desire to fulfill their level four needs. Self esteem needs include the desire to have one's skills and capabilities recognized, and to be a competent contributor. Therefore, people have a desire to learn new skills and demonstrate their proficiency with them. Once these skills are recognized, people are motivated by level five, or self actualization, needs. This is the highest level of motivation, and people at this level are motivated not by a desire to have their own skills recognized, but by a genuine desire to help others and contribute to the group's goals, for the good of the group.

The fundamental assumptions of this hierarchy are that once a need is satisfied, it is no longer a motivator, and that once people satisfy one need, they proceed up the hierarchy to the next need. Therefore, once people have fulfilled their safety and security needs, they are not motivated by measures that promise to fulfill these needs (for example, increased wages), except to the extent that they may result in increased status in the organization and therefore help to fulfill level four needs.

1.2.3 Discussion

Monetary incentives alone are not perceived as being great motivational tools in either of these theories. For example, Herzberg's Two-Factor Theory states that an adequate salary is a hygiene factor, not a motivator. Maslow's Hierarchy of Needs states that money ceases to
motivate after people have achieved their level two needs. According to these theories, and assuming that there is sufficient money to satisfy the hygiene factors and level 1 needs, money will motivate people only if it increases their feelings of recognition and achievement. Herzberg (1959, p.117) states that once there is sufficient money to satisfy hygiene factors "money earned as a reward for outstanding individual performance is a reinforcement of the motivators of recognition and achievement". Similarly, money may motivate people at Maslow's level 3 and 4 needs if, for example, it can buy them memberships in exclusive clubs that satisfy their belongingness and esteem needs. However, anyone who has worked under a bonus system will likely question the argument that monetary incentives are this limited. Nevertheless, the two theories can provide some insight into the merits of non-pay related variables in motivation. The debate over the merits of pay-related (or extrinsic) rewards and job-related (or intrinsic) rewards like recognition, advancement, and responsibility in motivation has continued for decades. This debate will be explored further in chapter 2.

1.3 INCENTIVES - DEFINITION

Employers have recognized the competitive advantage that can be gained from having a motivated work force for many years now. One practice often used by them to motivate people and increase productivity is to offer incentives to employees that motivate them to work harder. While there are many different types of incentive plans, with different implicit assumptions regarding motivation, they all share the general assumption that employees have an untapped reservoir of energy that will be drawn on only when they are given adequate motivation to do so. Their fundamental purpose has been defined differently at different times. For example, J.K. Louden (1944, p.13), said that they "offer a financial incentive for a worker or group of workers to produce work of an acceptable quality over and above a
specified quantity". Ian Smith (1983, p. 129) allows for intrinsic, or non-monetary, rewards when he describes incentive schemes as an "attempt to influence the behavior, and therefore work performance of the employees, through the provision of a monetary or non-monetary reward which is extra to basic remuneration". Whichever definition is used, it is clear that all employee incentives provide some form of reward for improved performance, and attempt to motivate employees to produce at the highest level they are capable of.

1.3.1 The Need For Incentives

Over the years, employers have realized that in many cases their traditional payment systems do not adequately motivate employees. This section will briefly describe the shortcomings of traditional payment systems, to convey why many employers have adopted incentive plans.

Prior to the wide-spread use of incentives, the standard payment system was day-rate pay, where each worker is paid a flat wage per day, regardless of production (Gilman, 1890). Under this payment system, efficient workers were paid the same amount as inefficient workers, thus leading to inequality in the payment system and bad feelings on behalf of the efficient workers. Before long, the efficient workers would decrease their output to match their inefficient counterparts, with the feeling that if they were paid the same, there was no point in working hard. This lead to what Frederick Taylor described (Copley, 1923) as "systematic soldiering", where each worker achieves only the minimum requirements each day to receive pay. In an attempt to eliminate systematic soldiering from the workplace and increase productivity, employers have experimented with a variety of pay systems.

One method that is often used to overcome this problem is "merit based pay", where salary increases are based on the merits of individual employees. This can be thought of as a
non-variable based incentive, as in practice merit increases are based on historic performance, and once given do not vary with future performance. Merit based pay has some serious disadvantages. First, recent merit pay increases have averaged 5-6% in most industries, and actual individual increases cluster around the average figure (Baime, 1990). In many cases, management is loathe to give increases that are substantially over, or below the average amount. With little differentiation between the increase given to "star" performers and average employees, the incentive towards positive work practices decreases, the credibility of the plans falters, and resentment on behalf of the star performer can occur. Furthermore, merit pay has little motivational impact on employees, as many of them see pay increases as an entitlement.

Second, merit pay increases are fixed cost increases. They reward employees for past performance by increasing future pay, regardless of their, or the company's, future performance. In cyclical industries this can be a dangerous trend, as wage increases in up-swings may lead to demoralizing salary cuts, or insolvency, in down-swings. Furthermore, if it is difficult to identify the causes of improved performance, merit pay increases could be granted during price up-swings when the company may be doing well despite poor work performance. Well developed incentives, on the other hand, are highly positively correlated with the performance of company employees.

Third, merit pay increases are often based on subjective performance appraisals. Introducing subjectivity into a pay system can result in unfairness and dysfunctional work practices if employees attempt to curry favour with their supervisors. Moreover, it can result in serious systemic problems if employees are afraid of voicing opinions contrary to their supervisors opinion, for fear of compromising their merit bonus.

Other methods initiated to increase productivity are designed to make a larger component of pay fluctuate with future performance, and include a host of different incentive plans. While they may not be appropriate in all industries, variable based pay systems are
becoming more common (Baime, 1990) as employers become aware of the weaknesses associated with day-rate pay and merit pay systems.

1.3.2 Types of Incentives

Incentives can be differentiated by many characteristics. These include the frequency of the bonus payments, bonus calculation methods, whether bonuses are paid on a group or individual basis, whether the incentives encourage participation with a communication network, and the types of rewards offered (either extrinsic or intrinsic).

The following pages will briefly review three types of incentive plans - piece work incentives, profit sharing, and gainsharing - to provide a basis for the in-depth analysis of gainsharing plans in the mining industry in subsequent chapters. A fourth form of incentive plan, employee share ownership plans, will not be considered in any detail. The reason for this is because, as motivators, they bear a great deal of resemblance to profit sharing plans.

**Individual Production Incentives**

Definition

Individual production incentives, or piece work plans, link financial remuneration to the unit productivity of individual employees. They therefore require the establishment of a rate, or bonus, that will be paid for each unit of production. In most cases, a minimum hourly wage is guaranteed, with rewards for production paid on top of it. For example, a sales person may receive a base wage plus a fixed percentage of the number of sales made. Employers
usually try to set the per-unit bonus so that an average worker earns a "fair and reasonable" rate of pay when working at an average pace. Often, a minimum amount of productivity must be achieved before the bonus calculation will begin. Bonuses are paid frequently, usually with pay cheques, making the reinforcement of this type of incentive quite strong. However, as there is no accommodation for teamwork or participation explicit in the definition of piece work incentives, they offer only extrinsic rewards.

History

The exact date of the development of individual production incentives is unknown. An Act of King Edward VI in the 16th century allowed workers to work at home, to be paid on the basis of piece work (Smith, 1983). Similar isolated examples have been noted since then (Babbage, 1832).

However, the first modern discussion and development of a piece rate incentive scheme was by F.W. Taylor in the early 1880's (Copley, 1923). Prior to this, attempts to overcome "systematic soldiering" by implementing these incentive schemes often failed, primarily because the piece rates were set on the basis of historical performance. This created two problems. First, in some cases, employees who were in production centres that were the most efficient in the past were penalized, as the piece-rate paid to them would be relatively small. If they had been working hard all of the time, the rate paid would be based on their optimum production. Therefore, their ability to increase production was limited, and so was their bonus. On the other hand, their less-efficient counterparts in other production centres would have piece-rates based on a production level far below their capacity. Their ability to increase production, and its associated bonus, resulted in large rewards for them purely as a result of being inefficient workers in the past.
Second, in a lot of cases employees showed that the incentive of the piece rate inspired them to produce more than anyone, judging from their past performance, could have guessed (Copley, 1923). As a consequence, employers often decreased the piece rates to avoid paying wages that often were far greater than the ones the original piece rates were intended to allow. This rate cutting had the following effect, as described by Taylor in 1895 (Copley, 1923).

"Even the most stupid man, after receiving two or three piece work "cuts" as a reward for his having worked harder, resents this treatment and seeks a remedy for it in the future....The latter [management] endeavors by every means to induce the workmen to increase the output, and the men gauge the rapidity with which they work, so as never to earn over a certain rate of wages, knowing that if they exceed this amount the piece-work rate will surely be cut, sooner or later".

Taylor wanted to put an end to this sub-optimal arrangement by basing piece rates on what he referred to as "time study", where the piece rates are based on the length of time in which work ought to be done (Copley, 1923). Using this method, the time that work ought to take is based not on past performance, but on the systematic measurement of each job's requirements. The jobs are broken down into their sub-routines, and the time that an average employee working at an average rate takes to complete each routine is estimated. The time taken for the sub-routines is then added to determine the total time requirements for each job. Time study was first used in the Midvale Steel Company in 1881 (Copley, 1923), and because it was a relatively unbiased and systematic approach to developing piece rates, the popularity of individual production incentives grew rapidly through the early 1900's (Nelson, 1980).

However, with the depression, many companies abandoned their incentive plans (Louden, 1944). This was in part because low production levels during the depression in response to diminishing markets made bonus payments unfeasible, but also because management, in struggling to remain solvent, had to cut costs and often did so by laying off people involved in the administration of the incentive plans. However, it is possible that the
depression only exacerbated the inevitable decrease in the popularity of the plans. This is because in their rush to implement these plans from 1900 to 1930, many companies did not consult people who were knowledgeable in production incentives. As a result, several of what Louden refers to as "evils" were perpetrated in this time, most resulting from poorly designed incentive schemes. Some of the problems he identified were a failure to teach the employees about the plans and enlist their cooperation, failure to convince foremen of the merits of the plan, failure to provide employees with a means by which to increase production, and a failure to establish standards that maintained quality and minimized waste. Whether because the depression made them obsolete, or because they were poorly designed, organized labour revolted against these plans in the early 1930's, and further decreased their numbers (Louden, 1944).

However, piece rate incentives are quite popular today. They are evident wherever clerks receive commissions for each sale, or where professionals can bill for each client they attend to. They are generally viewed as fair incentives because they provide ambitious individuals with a financial reward in line with the amount of work that they do.

Organizational Considerations

It is not difficult to see what effect these plans would have on production. With the wage tied to individual productivity, each employee would try to maximize their production. However, employee pursuit of individual gain can have some serious drawbacks. For example, in some cases production may increase at the expense of other unit costs like materials or maintenance. Similarly, safety or quality may deteriorate in the interests of increasing production. As a result, employee bonuses could increase with the unit costs of production, clearly not a desirable trend. Unless there is some allowance for these parameters
made in the bonus calculation, employees have an incentive to ignore the issues of total unit costs and quality to maximize their earnings.

There is no allowance made for intrinsic rewards with piece-rate incentives. Employee suggestions and involvement is not explicitly encouraged, so these incentives do not take advantage of the mental capabilities of the work force. Moreover, the ability to work as a team towards common goals is seriously compromised under piece rate incentives, as an employee's bonus is based on individual, not team, performance.

Piece-rate incentives have many more potential problems (Strauss, 1990). Often, although production initially increases, it falls short of its true potential. Among employees, the fear of rate cutting still exists, and as a result employees who "over produce" may receive peer pressure to decrease production. Also, workers may fear that if production is based on rates when they are "fresh", management will require equal production when they have less energy. Employees are sometimes also concerned that high production may result in layoffs. Another problem with these incentives is that they may result in destructive competition amongst employees (Strauss, 1990), as they attempt to surpass each other in earnings. In all likelihood, this would worsen safety practices and product quality. All of these factors can result in less than optimal production levels.

**Profit Sharing**

Definition

As the name suggests, profit sharing plans pay a bonus which is derived from company profits. If the company enjoys a profitable year, some percentage of the profits are paid to the employees; otherwise, no bonus is paid. Profit sharing plans can vary greatly, with the main
distinctions being whether the bonus is paid directly to employees or deferred to a later date, whether the bonus is determined by a fixed formula or is discretionary, and whether the plan is an addition or substitute to the existing pension plan (Strauss, 1990). Where offered as a supplement to the pension plan, profit sharing becomes as much a job benefit as an incentive, due to the large delay of the bonus payments. When used as an incentive, profit sharing bonuses are generally paid at the end of the financial year when corporate profits are measured, and are paid on a group basis. In some plans, a minimum level of company profitability must be achieved before bonus payout. Although there is no accommodation inherent in the definition for teamwork and participation, it is argued by some that because the bonus is group based and derived from company profitability, teamwork and communication will increase. Therefore, there may be some intrinsic rewards associated with profit sharing plans.

History

The modern literature on profit sharing dates back to Charles Babbage's "On The Economy of Machinery and Manufactures", in which he wrote in 1832 (p.177) that

"it would be of great importance, if, in every large establishment, the modes of paying the different persons employed would be so arranged, that each should derive advantage from the success of the whole, and that the profits of the individuals should advance as the factory itself produced profit, without the necessity of making any changes in the wages agreed upon."

However, the possible benefits of profit sharing occurred to Turgot in 1775, long before it was written up in journals, and it was first implemented by M. Leclaire in 1842 (Gilman, 1890). Leclaire was motivated to implement the scheme more through his altruistic ambitions towards his employees than his desire to increase his personal wealth. Nevertheless,
largely due to the good relationship he enjoyed with his employees prior to implementing the plan, the long term fortunes of his company increased dramatically with plan implementation (Gilman, 1890). Seeing his success, manufacturers in other industries adopted profit sharing schemes, many of which were successful (Gilman, 1890).

While a relatively rare form of employee incentive before the 1940's, profit sharing plans have multiplied to the point that 360,000 companies in the U.S. used them in 1984 (Strauss, 1990). Often, the schemes are introduced in exchange for wage concessions in times of business downturns (Strauss, 1990). Furthermore, they have been used to replace production processes where piecework is inappropriate due to non standardized outputs or high quality control requirements (Strauss, 1990). However, today the majority of the plans in the U.S. are deferred plans, which place earned profits into employee accounts, which are paid out at retirement, disability, or death (Hammer, 1988). As stated, these forms of profit sharing plans are more similar to pension plans than incentive systems (Strauss, 1990).

Organizational Considerations

The theory behind profit sharing plans is that the employees will identify with the corporate objective of increased profitability, and will therefore alter their work behaviors to be congruent with this objective. For the company, they have the advantage that labour costs change with the fortunes of the company. Therefore, when business is bad no bonuses are paid out and the cost of labour decreases. Furthermore, the employees share the good times with the company. However, some serious problems have been identified with profit sharing plans.

First, in most cases the bonus payment is not made with sufficient frequency to adequately reinforce the desired behaviors (Smith, 1983). Second, there is often only a tenuous link between worker performance and bonus, as market factors, accounting practices,
and management decisions, all of which are beyond the control of the employees, can have a radical effect on profitability. Therefore, in industries where profitability is exposed to selling price or exchange rate fluctuations, company profits may decrease despite improving worker productivity. For example, the volatile output price may create situations where despite stellar employee productivity, company profits decrease due to soft market prices. In this case, high work performance of the employees goes un-rewarded. Alternatively, employees may get large bonuses when the prices (and consequently profits) increase, despite poor work practices. This would reinforce sub-optimal performance among employees at work, and decrease the company's operating efficiency. This decreased operating efficiency will become painfully obvious during price down-swings. Poor management decisions can have a similar effect. This can result in employee anger and frustration as good work practices go un-rewarded, and can severely damage organizational morale. Third, in cases where company profits decrease, morale may plummet as bonus payments fall, thus decreasing the chances of a successful turnaround.

**Gainsharing**

Definition

While the name "gainsharing plan" leads one to believe that these incentives are formal and structured, they are in fact more a management philosophy than a set of rules. The philosophy behind these plans is that all people prefer to express themselves fully in all situations, and that in doing so they can be both constructive and supportive to the groups in which they are participating (Frost, Wakeley and Ruh, 1974). Furthermore, people should be given the opportunity to participate, and any gains realized should be shared between the
company and employees. The plans make employee bonuses depend on group performance, and then give employees the opportunity to affect this performance by encouraging them to apply their functional expertise in a pro-active manner. Therefore, management practices that encourage participation with some sort of communication network and provide an equitable reward for gains can be seen as gainsharing (Frost Wakeley and Ruh, 1974).

Bonuses, or gains, are paid to workers when they surpass pre-set standards. These standards are usually production related, but often include cost and safety parameters when appropriate. Gains can be shared to differing degrees by the company and employees, and generally range from a 25/75 split to a 75/25 split. Profitability is usually not a standard for bonus determination, as it can be affected far more by uncontrollable factors like commodity prices, exchange rates and accounting practices than by employee productivity. Many plans, however, include the sales value of production in the bonus formula. This is equitable when price changes are steady and predictable, meaning that any large changes in sales value of production are a result of changes in production, and not the selling price. The gains are paid at the frequency stated in the plan structure, usually quarterly or monthly, on a group basis. The size of the groups is generally determined by the natural work boundaries, or task interdependencies, and can range from the entire company to small production centres. Because gainsharing plans create a communication network and provide an opportunity to earn bonus pay, rewards can be both intrinsic and extrinsic in nature. The motivation provided by extrinsic rewards depends on the size and frequency of the bonus payments, and this varies from plan to plan. The intrinsic rewards are created through the communication network, as employees are given opportunities for recognition, authority, advancement, and greater job identification. The degree of reinforcement offered by the intrinsic rewards also varies from plan to plan, as the communication structures can be quite different. The dual reward characteristic of gainsharing plans will be explored further in chapter 2.
1.4 SUMMARY

Piece work, profit sharing, and gainsharing plans represent a large component of the incentives used to motivate production personnel. All three of these incentives have different effects and demands on employees, management, unions, and ultimately, the company. They encourage individual work habits, teamwork, and participation to differing degrees, making the choice of which incentive to implement depend on the peculiarities of each situation. Table 1 summarizes the main differences between the three incentive schemes discussed.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Gainsharing</th>
<th>Profit Sharing</th>
<th>Piece Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Employee identification with company goals</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>b) Opportunities for employee input</td>
<td>High</td>
<td>Medium to Low</td>
<td>Low</td>
</tr>
<tr>
<td>c) Motivational ability</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>d) Infrastructure required</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>e) Bonus paid to:</td>
<td>Groups</td>
<td>Groups</td>
<td>Individuals</td>
</tr>
<tr>
<td>f) Bonus based on:</td>
<td>Factors over which employees have control</td>
<td>Company Profitability</td>
<td>Individual Productivity</td>
</tr>
<tr>
<td>g) Reward form:</td>
<td>Intrinsic and extrinsic</td>
<td>Intrinsic and extrinsic</td>
<td>Extrinsic</td>
</tr>
<tr>
<td>h) Bonus payment frequency</td>
<td>Monthly quarterly</td>
<td>Yearly</td>
<td>With paycheques</td>
</tr>
<tr>
<td>i) Management style</td>
<td>Must be facilitative / participatory.</td>
<td>Anything</td>
<td>Anything</td>
</tr>
</tbody>
</table>
a) As explained above, although theoretically both profit sharing and gainsharing provide employees with the incentive to act in the company's best interests, the tenuous link between work performance and bonus under profit sharing plans leads to lower identification with company goals than with gainsharing plans. Moreover, profit sharing does not necessarily establish a communication network through which information exchanges and problem solving processes, which are essential in building employee identification with company goals, can evolve. Piece work incentives encourage the employee to maximize his or her individual gains, regardless of company policy.

b) Gainsharing provides a formal employee feedback system, which employees are encouraged to use. Employees have an incentive to suggest ideas to management in profit sharing schemes but not a formal mechanism through which to do this. Employees have neither the incentive nor the mechanism under piece-rate incentive schemes.

c) The motivational ability of profit sharing schemes is quite low due to the tenuous relationship between productivity and bonus (Hammer, 1988), and infrequent bonus payments. With gainsharing, the bonus is usually based on standards directly controllable by employees, and paid more frequently. Furthermore, employees have opportunities to contribute to work processes and problem solving, and intrinsic rewards associated with these opportunities can be high. Piece work incentives are paid on an individual basis, and therefore ultimately controllable by individual employees. Due to the direct performance/reward relationship, the motivational ability of this incentive is high.

d) Gainsharing demands a communication system, as well as efficient accounting systems for setting accurate standards, and explaining and calculating bonuses. Profit sharing and piece work incentives require accurate accounting systems for similar reasons.

g) Because they encourage employees to make suggestions and assume that by making these suggestions they satisfy self esteem and self actualization needs, both gainsharing and
profit sharing can provide intrinsic and extrinsic rewards. Piece work provides extrinsic rewards only, through the financial reward.

i) To be effective, a gainsharing plan requires a facilitative and participatory management style. Because there is no explicit call for a communication network with profit sharing and piece rate incentive plans, any management style can be used in conjunction with them.

The following chapter will examine gainsharing in greater detail by discussing its history and theory, and providing some examples of possible applications.
CHAPTER 2 - GAINSHARING - HISTORY, THEORY AND EXAMPLES

2.1 HISTORY

The concept of gainsharing has been credited to Joseph Scanlon, whose diverse background provided a catalyst for effective communication between both management and union personnel, and helped to create an environment of mutual cooperation. Gainsharing was first introduced in the Nunn-Bush Shoe Company in 1935 (Graham-Moore, 1990a) but it was not until 1938, when a gainsharing plan was implemented at the Adamson Company in Ohio, that the potential of these plans was realized. As a labour leader in 1938, Scanlon was aware that the demise of the Adamson Company, a small steel tank producer, was imminent (Golden, 1958). High costs were driving the company out of business and in an attempted turnaround, a union/management productivity plan was introduced where workers shared any tangible savings in labour costs with the company and were given opportunities to make suggestions. Through employee involvement (one $8000 suggestion saved the company $150,000 in the first year), the company started to make a profit (Golden, 1958). Magazine articles in Life (1946) and Fortune (1950) increased the exposure of gainsharing and resulted in its adoption by about 50 companies by 1950 (Gowen, 1990).

For the most part these first plans consisted of defining what the ratio of labour costs to the sales value of the output should be. Then, any savings under these expected labour costs were shared between the company and employees. In addition, union/management committees were established to solicit, review, and (if approved) implement employee suggestions.

Since 1950, however, other forms of gainsharing have materialized. Because of the flexibility of gainsharing plans to diverse operations, and the increased focus on productivity
in many industries in the 1980's, interest in gainsharing has increased (Graham-Moore, 1990a) to the point that approximately 15% of U.S. firms use it (Rollins, 1989).

2.2 GAINSHARING THEORY

Academics have been studying gainsharing since the 1940's, with the first studies being done by Joseph Scanlon at the Massachusetts Institute of Technology. Most of the gainsharing studies (for example Davenport, 1950) have focused on the Scanlon plan and have been case studies which have contributed empirical results to the field. However, while these case studies and empirical surveys have helped people to identify some of the factors which are conducive to gainsharing and some of the effects it has on involved parties, for the most part they have not helped to reveal why it works, nor have they discussed the relative importance of the intrinsic and extrinsic rewards in motivation.

White (1979) stated that the Scanlon Plan "had its origins in actual practice and is virtually void of theory". Consequently, there have been some attempts to adapt a theory to the practice of gainsharing. While it is not the intent of this research to develop or examine the theory of gainsharing in great detail, this section will briefly summarize some of the theories developed to explain its results.

One of the first attempts at attaching a theory to the practice of gainsharing was made, albeit indirectly, by McGregor in 1960. He developed two sets of assumptions, Theory X and Theory Y, that lead to different management styles. Theory X (p. 33) states that:

1) The average human being has an inherent dislike of work and will avoid it if he can.

2) Because of this human characteristic of dislike of work, most people must be
coerced, controlled, directed, or threatened with punishment to get them to put
forth adequate effort toward the achievement of organizational objectives.

3) The average human being prefers to be directed, wishes to avoid responsibility, has
relatively little ambition, wants security above all.

This set of assumptions leads to autocratic, directive management styles that are
appropriate and needed at times but, when used exclusively, fail to "discover, let alone utilize,
the potentialities of the average human being" (p.43).

Theory Y assumes that:
1) The expenditure of physical and mental effort in work is as natural as play or rest.
2) External control and the threat of punishment are not the only means for bringing
about effort towards organizational objectives. Man will exercise self-direction
and self-control in the service of objectives to which he is committed.
3) Commitment to objectives is a function of the rewards associated with their
achievement, (where the most significant rewards are ego satisfaction and self-
actualization).
4) The average human being learns, under proper conditions, not only to accept but to
seek responsibility.
5) The capacity to exercise a relatively high degree of imagination, ingenuity, and
creativity in the solution of organizational problems is widely, not narrowly,
distributed in the population.
6) Under the conditions of modern industrial life, the intellectual potentialities of the
average human being are only partially utilized.

McGregor adopts Maslow's "Hierarchy of Needs" to explain the relative merits of
Theory X and Theory Y management assumptions. He states (p. 41) that the "carrot and stick"
theory of motivation that goes along with theory X
"does not work at all once man has reached an adequate subsistence level and is motivated primarily by higher needs. Management cannot provide a man with self-respect, or with the respect of his fellows, or with the satisfaction of needs for self-fulfillment. We can create conditions such that he is encouraged and enabled to seek such satisfactions for himself, or we can thwart him by failing to create those conditions."

By using management styles consistent with Theory Y, management can create conditions that give people an opportunity to fulfill their self-esteem and self-actualization needs. Furthermore, McGregor states (p.110) that the Scanlon Plan is a philosophy of management which "rests on theoretical assumptions entirely consistent with Theory Y." Therefore, using this model, the theoretical argument for increased motivation when using gainsharing plans is that through participation they give employees an opportunity to fulfill their higher needs on Maslow's hierarchy and, because these needs are unfulfilled, this opportunity acts as a strong motivator.

A second theoretical discussion of gainsharing was by Frost, Wakeley, and Ruh in 1974. They state that there are three conditions that must be satisfied in a Scanlon Plan: Identity, participation, and equity. Identity refers to the explicit identification of each employee and their roles within the organization. This allows the employees to establish their common ground with the organization and discover that "the employees are the organization" (p.53). If fully identified with the company, employees will know where the company wants to be in the future as well as their responsibilities in helping the company to get there. They will then be suitably armed to participate effectively by providing suggestions that can further company objectives.

Participation must be present to develop the individual employees and establish them as part of a team. This will increase each person's commitment to the company and its goals. In this theory, participation is the most important condition, as it provides a medium through
which they can express the ideas they will have developed as a result of "identifying" with the company. The authors state (p.63) that "to develop the awareness of the need for change in the organization but to inhibit initiative or action to meet the need will frustrate most rational employees".

Equity must be present to ensure the employees that they are not being manipulated by management. Equity in sharing any gains from the employees' and the company's improved performance through participation will help to "build sustained interest, reliable performance, and mutual trust" (p.53). Management competence was later added as a fourth condition for the Scanlon Plan (Gowen, 1990). While one of the few major attempts at explaining the success of the Scanlon Plan (Gowen, p.92), the theory of Frost et al "has not proven useful for generating or testing hypotheses" (Schuster, 1983; Gowen, 1990).

Goodman and Moore (1976) adopted expectancy theory as a framework to study a manufacturing company that had just implemented a Scanlon Plan as an employee incentive. They assumed that the expected rewards from participation, as well as the individual's beliefs in their ability to generate suggestions, would have a large effect on the success of the plan, and further stated that expected rewards would depend on individual variables (ie. education), organizational variables (ie. culture and the nature of work), and interpersonal variables (ie. relationship with superiors).

Testing consisted of contacting 95 blue collar workers and managerial employees in a manufacturing firm that used a Scanlon Plan. Structured interviews, questionnaires, and company records were used to measure plan variables. Data was collected before the plan was introduced, three months later, after the plan was introduced, and six months after that. After testing, they found that there is some differential acceptance of the expected rewards of Scanlon plans among company personnel, and that these differences "seem" related to individual, organizational, and interpersonal variables. In particular, they found that the
managers' expectancies of success are influenced by individual variables to a greater extent than the blue collar workers' expectancies, and presume it is due to the managers' better understanding of the plan. For the blue collar workers, organizational and interpersonal variables had a relatively large effect on expected Scanlon plan success. For example, in cases where neither the organizational variables (for example the organization exhibits a lack of trust and low participation), nor the interpersonal variables (for example the work group has poor perceptions of the plan, or the supervisor does not appreciate participation) are conducive to gainsharing, the blue collar workers' expected rewards from its implementation would be low. This indicates the importance of company dynamics in gainsharing plan success.

While this study provides insights into some of the factors which influence people's expectancies of gainsharing plans, it is questionable that these expectancies play a large part in plan success. Some problems with this study, for example a small sample size, measurement problems, and the short time period (six months), have limited further discussion of expectancy theory and the success of gainsharing. Moreover, White (1979) found weak evidence that expectations play a part in gainsharing success.

In analysing the Scanlon Plan in 1976, Geare criticized the role of participation in employee motivation. He says that there are three assumptions found in the literature surrounding participation in the work place:

1) Employees want to participate.

2) This participation will result in productivity improvements.

3) Financial motivation is secondary to the motivation provided by the opportunity for participation.

However, "the evidence supporting all three of these assumptions is by no means conclusive". Geare suggests that participation is popular in Scanlon Plans because it is well
rewarded financially, not because of its intrinsic motivational capabilities. Furthermore, in discussing intrinsic rewards in the work place, he says that "some managers are very keen to pick up on the idea that all workers really want is participation and self-actualization - it seems so very cheap". While he does not provide a model to explain why gainsharing works, Geare does provide a compelling argument as to the relative ability of participation and financial rewards to motivate employees. In tests of this, however, Rosenberg and Rosenstein (1980) found that productivity increases are more a function of participation than the financial bonus received.

In 1980, Rosenberg and Rosenstein reported on a study they designed to appraise the effects of worker participation on productivity in a unionized foundry. By collecting and analysing records of 262 employee/management meetings over a six year period, the authors tested the hypotheses that manufacturing productivity will tend to increase with participation and that the tendency for manufacturing productivity to increase with participation will be regulated by the level of monetary rewards paid to the participants. Participation was measured in terms of the frequency, relevance, interaction, attendance, and representation associated with it. They found that there was a significant difference between productivity in the pre-participation period and after the participation plan was introduced, despite some improvement in productivity in the pre-participation year. Furthermore, this upward trend in productivity was sustained over the five years in which the plan was in place. The authors then incorporated the effect of a monetary reward into the regression analysis relating participation and productivity to determine the effect it would have on productivity variance. They found that while the reward did regulate productivity, participation, and not the monetary reward, was the principal instrument of change in productivity. However, the authors contend that it is the output of participation, namely organizational problem
identification, problem solving, and joint decision making, rather than worker satisfaction, that increases productivity.

One of the more recent models formulated to explain gainsharing was developed by Mawhinney and Gowen in 1990. They provide a framework, known as the "matching law", to explain different levels of adoption rates and effectiveness among gainsharing programs. The matching law states that "targeted behavioral performances" can be influenced by "valued consequences of behaviors". The degree to which the valued consequences can help to achieve the targeted performances depends on the rate, amount, and delay between the occurrence of the performance and the receipt of the valued consequence. Drawing on this law, they hypothesize that the relative importance of intrinsic and extrinsic rewards depends in part on the delays associated with them. In cases where the financial bonus has a large delay, social reinforcements from peers and other intrinsic rewards, "even if small in amount relative to the monetary reinforcements, ... might produce relatively large increments in value because they would occur with minimal delays". They make other observations on gainsharing effectiveness, including that the most effective gainsharing programs will have minimal delays between performance and monetary rewards, that the effects of delays will be mitigated by system components that increase intrinsic rewards, and that at some critical delay length in financial rewards, group performance norms will determine program effectiveness. In other words, when monetary rewards are given after very long delays, they stop having motivational powers.
2.3 GAINSHARING - MORE DETAIL

Gainsharing is a form of incentive that combines a traditional cash incentive, through the group bonus payment, with intrinsic incentives, through participative management. It tells employees that their bonus depends upon performance, and then gives them the opportunity and incentive to apply the expertise they have in their organizational functions to affect that performance. The opportunity is provided by the communication network, and the incentive comes in the form of the intrinsic rewards of participation and the extrinsic rewards of the bonus payments. The following diagram will make the relationship more clear.

![Diagram of Gainsharing Incentive]

This diagram is a great simplification, as it assumes that the gainsharing plan is well accepted and well managed. The acceptance and management of the plans can be quite complicated, however, and must consider several factors, including company culture, personnel, and the market situation, all of which will be addressed later.
Gainsharing plans are very flexible and can be customized to reflect different corporate goals and strategies (Hammer, 1988). Some examples of gainsharing plans include Scanlon Plans, Rucker Plans, and Improshare Plans. These plans differ primarily by the parameters used to measure productivity (for example, sales value, value added, labour costs, total costs of goods sold), and the sophistication and design of the communication network.

2.4 GAINSHARING - EXAMPLES

This section will introduce three categories of gainsharing plans, Scanlon Plans, Rucker Plans, and Improshare Plans, by describing how their bonus calculation methods and communication networks differ.

2.4.1 Bonus Format:

A bonus that is paid after pre-set work standards are surpassed is common to all gainsharing plans. This bonus is shared between the company and employees according to the ratio stated in the plan outline. Depending on the plan, the employees' share of the bonus can have a fixed percentage deducted and placed in a reserve pool. Generally, the reserve pool is used to reimburse the company in months when labour costs exceed the budget, and therefore it makes the fortunes of the company less variable. It cannot be negative if employees consistently produce below the budget, and in the interests of equity, any positive balance in the pool is paid out at year end. After the deduction of the reserve pool, the remaining balance is distributed to employees either on an absolute basis, where everyone receives the same size bonus, or as a percentage of wages. The decision regarding the method (either absolute or...
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percentage) used to distribute the bonus is often the most contentious issue in gainsharing plans (Bovino, 1992). However, if one assumes that those with higher wages are most responsible for the productivity increases, it is logical to give them larger rewards for performance increases, and therefore pay bonuses as a percentage of wages.

The method used to calculate the gainsharing bonus is crucial to plan success. The two most important considerations when determining the bonus are that the bonus parameters are tightly linked to organizational key success factors, and that employees' work performance can have a large effect on these parameters.

The bonus parameters must be linked to organizational key success factors because bonus payments will become a focal point for all personnel. If these parameters are appropriate measurements of organizational effectiveness, people will be focused on factors essential to the success of the company. If the bonus parameters are not appropriate key success factors for the business, people's efforts and attention will be diverted from the critical business factors, and this will seriously threaten the capability of the firm to compete in the long-term.

The employees must be able to affect these key success factors through their work performance. The ability to directly affect the extrinsic rewards will result in high motivation. "Money [as a reward] moves performance if [the reward] is based on factors over which people have control" (Bovino, 1992). If one agrees that extrinsic rewards can move performance, it is highly probable that employees would be more motivated by a bonus based on factors over which they have a great deal of control, than one based on factors over which they have little control.

Other considerations are that the bonus calculation is easy both for the employees to understand, and for the company to measure accurately. For the company to be successful, it is important that employees understand how their work performance relates to the bonus payouts, and more importantly, what changes in operations must occur in times of low bonus
payouts to improve performance. Finally, bonus parameters that can be easily and accurately measured by the company will improve its ability to provide accurate, timely information to all interested parties.

Once the bonus calculation is set up, its management is also critical to gainsharing success and one of the most difficult aspects of this is the establishment of the parameters that must be surpassed prior to bonus payouts. These standards will affect the attainability of bonuses for employees and will impact the plan credibility, and the employee management relationship. The process of setting standards is very exacting, as they must be set so that they allow adequate bonuses when operations are productive, but do not over-pay during those times or discourage employees by being out of reach.

There are two methods often used to set work force standards: Historical analysis and time studies. Historical analysis involves setting work standards based on the historic production rates of comparable products using comparable processes. While quite simple, this method suffers from some of the problems associated with piece-rate plans. Namely, it assumes that historic production numbers accurately reflect the true productive capacity of the work force. If this is not true, production could jump, vastly inflating bonuses and requiring an increase in the standards, which could have a deleterious effect on labour relations. With this in mind, when there is some doubt about the accuracy of historic information, the work standards should err on the side of being tough to achieve, as the company will find it far easier to lower work standards than to raise them. Alternatively, bonus caps can help to solve this problem, but they too may result in some resentment on behalf of employees, depending on company policy regarding the excess bonus and the frequency with which the cap is required. Furthermore, if the bonus structure is designed properly, placing a cap on bonus payouts is tantamount to placing a cap on performance gains. This policy may make little sense in many cases.
Another method of setting work standards is time studies which, while more difficult to use, can more accurately measure the true productive capacity of the employees. These have already been described in section 1.3.2.

One factor which will greatly ease the management of standards, as well as other aspects of gainsharing plans, is the existence of a large amount of trust between management and employees. One way to achieve this trust (and give people a stake in the viability of standards) is to involve employees in the process of standard setting. As Frost, Wakeley, and Ruh (1974) state (p.121) "As long as engineers put standards on employees instead of with employees, they will be mistrusted". With good communication and shared goals, standard setting can be relatively painless, effective, and enlightening for both management and employees. Another way to ease the problems associated with standard setting is to define, when developing the gainsharing plans, the conditions which will cause a change in the level of the work standards. Some considerations may include inflation, or radical changes in production methods or technology. Some of the pitfalls in managing the bonus reveal the importance of the organizational climate in gainsharing plan success.

**Scanlon Plan**

The Scanlon Plan bonus is based on the labour costs required to produce a given sales value of production. A base ratio of payroll divided by sales is established based on either historical analysis or time studies. At the end of each bonus period, the actual labour costs are compared to the expected labour costs using the base ratio. Any savings in payroll are distributed between the company and employees after a portion of the savings have been put in a reserve pool. The bonus is usually distributed on a percentage basis, meaning those with higher salaries receive bigger bonuses. The calculation proceeds as follows, assuming a base
ratio of 20% allowable labour costs to sales value production, and a 25/75 company/employee split:

Table 2
Simple Scanlon Plan Bonus Calculation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sales of new production</td>
</tr>
<tr>
<td>2.</td>
<td>Less sales returns, allowances, discounts</td>
</tr>
<tr>
<td>3.</td>
<td>Net Sales</td>
</tr>
<tr>
<td>4.</td>
<td>Add: increase in inventory (at cost or selling price)</td>
</tr>
<tr>
<td>5.</td>
<td>Value of production</td>
</tr>
<tr>
<td>6.</td>
<td>Allowed payroll costs (20% of value of production, taken from the base ratio standard)</td>
</tr>
<tr>
<td>7.</td>
<td>Actual payroll costs (assumed)</td>
</tr>
<tr>
<td>8.</td>
<td>Bonus pool</td>
</tr>
<tr>
<td>9.</td>
<td>Company share (25%)</td>
</tr>
<tr>
<td></td>
<td>Employee Bonus Before Adjustments</td>
</tr>
<tr>
<td>10.</td>
<td>Reserve for deficit months (25%)</td>
</tr>
<tr>
<td>11.</td>
<td>Employee share - immediate distribution</td>
</tr>
<tr>
<td>12.</td>
<td>Participating payroll costs</td>
</tr>
<tr>
<td>13.</td>
<td>Bonus percentage ($16,875/$168,750)</td>
</tr>
</tbody>
</table>

Adapted from Graham-Moore, 1990b.

This formula has the advantage that it is easy to understand and administer. However, it does not cover such costs as overhead, materials, and waste, and bonuses are dependent on the sales value of production. Therefore, its main applications are in labour intensive industries (Graham-Moore, 1990b) where the commodity prices are quite stable. It can, however, be made more complex and more versatile by adding other items that can be controlled by employees, like materials and maintenance costs.
Rucker Plan

Rucker Plans base the bonus on the ratio of the company's total payroll to value added (sales revenue minus cost of goods sold) (Hammer, 1988). Because labour costs, material supplies, and costs of services are all encompassed in the cost of goods sold, they are included in the bonus calculation, and any savings in these areas are shared with the employees (Miller and Schuster, 1987). The Rucker standard, which must be surpassed prior to bonus payout, indicates expected labour value added to the product, expressed as a percentage of value added (Graham-Moore, 1990b). This standard can be applied against actual value added in a period, to determine allowable labour costs. If allowable labour costs are less than actual labour costs, the gain is shared with employees. Under this system, therefore, employees will have the incentive to increase value added without allowing a corresponding increase in labour costs. This is in the company's best interests because increasing the value added to a product often means that the cost per unit is decreasing. An example of the calculation of this type of bonus appears in Table 3, assuming a 50/50 company/employee split, and a Rucker standard where labour costs are expected to be 41.17% of value added, determined from historic performance.

As can be seen in Table 3, the Rucker formula bonus is quite simple to calculate. It rewards the employees for efficient use of their time and materials. However, because the sales value of production is included in the formula, the bonus will vary with the market price of the commodity. In industries that experience large fluctuations in commodity prices, bonuses could fluctuate radically despite a consistently productive work force. This could create a sense of frustration on behalf of the employees regarding their bonuses and decrease the effect of the incentive.
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Table 3
The Rucker Value Added Formula

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Value of production (sales +/- various adjustments)</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>2. Less outside purchases (materials, supplies, energy)</td>
<td></td>
</tr>
<tr>
<td>materials and supplies</td>
<td>$500,000</td>
</tr>
<tr>
<td>other outside purchases, non-labour costs</td>
<td>160,000 660,000</td>
</tr>
<tr>
<td>3. Value added (1-2)</td>
<td>340,000</td>
</tr>
<tr>
<td>4. Allowed employee costs (from Rucker standard - 41.17% assumed)</td>
<td>139,978</td>
</tr>
<tr>
<td>5. Actual labour (employee costs)</td>
<td>129,978</td>
</tr>
<tr>
<td>6. Bonus pool (4-5)</td>
<td>10,000</td>
</tr>
<tr>
<td>7. Company share (50% * 6)</td>
<td>5,000</td>
</tr>
<tr>
<td>8. Employee share (6-7)</td>
<td>5,000</td>
</tr>
<tr>
<td>9. Reserve for deficit months (25% * 8)</td>
<td>1,250</td>
</tr>
<tr>
<td>10. Bonus pool (8-9)</td>
<td>3,750</td>
</tr>
<tr>
<td>11. Participating payroll</td>
<td>80,000</td>
</tr>
<tr>
<td>12. Bonus percentage (10/11)</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

Adapted from Graham-Moore, 1990b.

**Improshare**

Improshare focuses on the number of hours required to complete a certain amount of work. If the actual hours required to do the work are less than expected (budgeted) hours, a gain has been realized and is shared between the company and the employees. The mechanics of the bonus calculation proceed as follows. First, the standard hours required to produce a certain amount of work is determined. The standard hours, or "production hours", can be found using time studies or, as is done in the following example, be taken from a suitable base period. These hours (1600 in Table 4) reflect the hours of those people directly involved in the production of the units and do not include "non-production" hours like shipping, maintenance, set-up, overhead, and staff hours. A "Base Productivity Factor" (BPF), defined as production plus non-production hours divided by production hours, is established to
facilitate bonus calculations in future periods. By multiplying future production hours by the BPF, we find the total amount of production and non-production hours allowed for the units produced. These hours are called "Improshare Hours". If these hours are greater than actual production and non-production hours in the period being measured, a gain has been realized.

Table 4
The Improshare Calculation

<table>
<thead>
<tr>
<th>A) Development of Base Productivity Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facts: 40 direct and 20 indirect employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product A = 20 employees * 40 hours = 0.8 per piece or .8 * 1000 = 800 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 pieces</td>
</tr>
<tr>
<td>Product B = 20 employees * 40 hours = 1.6 per piece or 1.6 * 500 = 800 hours</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>500 pieces</td>
</tr>
<tr>
<td>Total production hours are therefore 1600 in the base period.</td>
</tr>
</tbody>
</table>

\[
\text{Base Productivity Factor (BPF)} = \frac{\text{total production and non-production hours}}{\text{total production hours}} = \frac{(40 \text{ direct employees} \times 40 \text{ hours})}{(20 \text{ indirect employees} \times 40 \text{ hours})} = \frac{2,400 \text{ total hours}}{1600 \text{ production hours}} = 1.5
\]

<table>
<thead>
<tr>
<th>B) Monthly Bonus Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A = 0.8 hours \times 600 units \times 1.5 BPF = 720</td>
</tr>
<tr>
<td>Product B = 1.6 hours \times 900 units \times 1.5 BPF = 2,160</td>
</tr>
<tr>
<td>Improshare hours (standard hours for units produced) = 2,880</td>
</tr>
<tr>
<td>Less actual hours (assumed) = 2,280</td>
</tr>
<tr>
<td>Gained hours = 600</td>
</tr>
<tr>
<td>Employee share = 50% of 600 = 300/2280 = 13.1%</td>
</tr>
</tbody>
</table>

Adapted from Graham-Moore, 1990b.
One of the chief advantages of Improshare is that the bonus is independent of the sales value of output. It is a measure of work productivity, and there is a direct relationship between the bonus and the work done. Consequently, there can be some motivation to work harder. Also, by using the Base Productivity Factor the bonus calculation can be made at any time, for any given interval of work. This characteristic allows for weekly bonus payments, and such frequent payments can have a large effect on worker productivity. In cases of weekly bonus payments, often a four-week moving average of bonuses is used to smooth out the high and low payouts (Graham-Moore, 1990b). However, the formula as given above includes the productivity of labour only. Therefore, materials and maintenance costs may increase to facilitate decreased labour costs, resulting in artificially inflated bonuses. Quality may also suffer in the drive to increase productivity. Furthermore, the incentive for employees to make suggestions regarding non-labour savings is diminished. For this reason, there is usually not a very sophisticated communication network associated with Improshare plans. For the purposes of this research, only those Improshare plans that have some sort of communication network to encourage employee suggestions and opinions will be considered gainsharing plans.

Other

The above three examples of bonus calculation formats provide some idea of the alternatives available to companies. There are, of course, other possible calculation methods for bonuses. For example, a method used frequently in mining is the cost/unit of metal produced.

The bonus standard can be modified to include allowances for changing production levels. For example, a bonus line (Bovino, 1992) can be constructed based on the historic cost of producing the product at different production rates. This builds flexibility into the bonus
calculation because at relatively high production rates one expects the unit costs of production to be relatively low and vice-versa, despite consistent employee work performance. A system that uses a bonus line adjusts for different production levels to more accurately reward employees for work performance. Figure 4 illustrates a bonus line.

![Bonus Chart](image)

**Figure 4**

Gainsharing Bonus Chart
(Adapted from Bovino, 1992)
This bonus line reflects the fact that low production rates will naturally result in higher unit costs as fixed costs are distributed over a smaller production level. Consequently, it automatically adjusts bonus levels for changing operating conditions, thus decreasing the need to alter the trigger points. For example, in some mines average haulage distances vary for a variety of reasons. In these cases, when there are large haulage requirements production is expected to be relatively low and operating costs relatively high, other things being equal. Put another way, when haulage distances are minimal production and its cost will naturally improve, despite employee work performance. In the absence of a bonus line, employees may receive bonuses when work performance is actually decreasing. With a bonus line, employees must strive to surpass their historic performance in similar ground to earn bonuses, and consequently they focus on minimizing costs like dilution and maintenance in all areas of the mine. In this way, bonus levels are closely linked to employee performance rather than uncontrollable mine characteristics. Depending on the commodity being produced, both the slope of the bonus line and the values above it can be designed to place different emphases on the effect that total production and the cost of production have on bonus levels. In the example above, the market for output is assumed to be limited and consequently the bonuses are focused on the cost of production.

Another customization is to make the ratio of sharing of gains between the company and employees dependent upon the size of the gains. If the employees' share of the gains increases as the total gains increase, they will have an even greater desire to improve their work performance.
2.4.2 Communication Network

A communication network that allows management to solicit employee opinions and suggestions relating to organizational policies is essential to all gainsharing plans. Incentive plans that have bonus structures similar to gainsharing plans but lack a communication network are not gainsharing plans, but simply group bonus plans. Many improvements possible through gainsharing arise because of the communication network, as it can create an environment of cooperation and teamwork between personnel and departments that cannot be created using a group bonus calculation alone. The philosophy of gainsharing is that employees have some expert knowledge regarding their function in the organization which, if expressed fully, will be beneficial both to the firm in terms of increased efficiency and effectiveness, and to the employee in terms of intrinsic rewards. The communication network provides employees with the opportunity to participate in the work process. The incentive to participate is derived from the intrinsic rewards, as participation in groups and access to information helps employees realize their level 3, 4, and 5 needs on Maslow's Hierarchy, and from the extrinsic rewards if employees believe that their participation will improve the performance of the company.

The importance of this stage in developing a gainsharing plan cannot be overstated. Herzberg (1959) states (p. 117) that the "aspect of participation and of increased responsibility is the real secret of whatever success the Scanlon Plan and its imitators have achieved". The effects of the communication structure can spill over to the entire organization and reinforce, if not drive, the evolution of the corporation in terms of how it treats its employees, interacts with suppliers, customers, and government, and deals with its competition. Like the bonus formats, the communication network can vary from plan to plan. The following section provides a brief outline of the "typical" setup in Scanlon, Rucker, and Improshare plans.
Scanlon Plan

In Scanlon plans, the communication networks are often a two-tiered system of committees: Production committees and screening committees (Schuster, 1983; White, 1979). Production committees are distributed throughout the organization, and consist of two to five employees from each production centre and supervisory level management. These teams meet about once a month with upper management personnel to discuss challenges being faced in their particular production units. The teams develop ideas, evaluate suggestions, and have the authority to implement ideas that are within pre-specified cost guidelines as long as they do not impinge on the operations of other production teams. These meetings provide an opportunity for the idea exchange and information sharing essential to efficient management.

There is one screening committee in the Scanlon Plan. It consists of representatives from the production committees and top management (Goodman, Wakeley and Ruh, 1974), and has four primary responsibilities (Schuster, 1983). First, it has the final decision on suggestions that exceed the cost guidelines given to the production committees. Second, it reviews suggestions that are rejected by the production committees. This review demonstrates that all suggestions are valued and extracts the information value from all suggestions, as they could be applied to other production centres, or used at a later time. Third, it considers current business problems and evaluates long range issues. Last, it oversees the long term planning for the gainsharing plan and oversees its administration, which involves periodic bonus explanation and distribution.

Rucker Plans

The communication network in Rucker plans can consist of one production committee and screening committee, or just one screening committee. The production committee will
generally consist of ten to fifteen employees, and some management personnel. This committee meets monthly on company time to review suggestions and discuss production problems. The intent of the committee is more to facilitate communication than to solve specific problems. The screening committee is composed of some employees, union leaders, and key management personnel. This committee monitors the bonus calculation, addresses production and quality issues, and discusses long term economic plans. The emphasis on the communication network is not as great in the Rucker plan as it is in the Scanlon Plan, as can be witnessed by the single production committee.

**Improshare**

There is nothing in the Improshare structure or philosophy that requires formalized employee involvement structures. However, some of the plans have a bonus committee that oversees the monthly bonus calculations (Miller and Schuster, 1987). Furthermore, there are some companies that use Improshare plans along with communication structures similar to Scanlon Plans (Miller and Schuster, 1987; Graham-Moore, 1990b). Moreover, Mitchell Fein, who developed Improshare plans, favours a communication network that will result in clear communications and productivity suggestions similar to those produced in Scanlon Plan companies (Graham-Moore, 1990b). As a gainsharing plan requires a communication network with the appropriate bonus structure, those Improshare plans that do not have a network will not be considered gainsharing in this paper.

**Other**

Other possibilities for communication networks include having all members of separate production centres regularly meet with immediate supervisors and some appropriate
top management. This ensures that all employees have an opportunity to communicate, and draws more skills into idea development and evaluation. An overall advisory board, made up of management, employee personnel, and union personnel if appropriate, would monitor, evaluate, market, and develop the gainsharing plan as conditions require. It will also serve as a liaison between the production centres, and serve to increase communications between them.

Schuster (1983) states that the typical Scanlon Plan communication systems have an 80% acceptance rate, as opposed to the 75% rejection rate of contemporary suggestion systems. Table 5 summarizes the ways in which the Scanlon Plan overcomes the weaknesses of traditional suggestion systems.

Table 5
Scanlon Plans and Suggestions

<table>
<thead>
<tr>
<th>Problems with traditional incentive systems</th>
<th>Scanlon response</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Small pay-off to workers.</td>
<td>(1) Larger percentage of savings through Scanlon is returned to work force.</td>
</tr>
<tr>
<td>(2) Resentment towards suggestions given by fellow workers.</td>
<td>(2) Workers get recognition from co-workers for suggestions because they also benefit.</td>
</tr>
<tr>
<td>(3) Negative effect on foreman-worker relations as suggestions perceived as challenge to supervisory competence.</td>
<td>(3) Foremen involved in suggestion development and evaluation.</td>
</tr>
<tr>
<td>(4) Determination of suggestion ownership.</td>
<td>(4) No need to determine ownership.</td>
</tr>
<tr>
<td>(5) Discourage group discussion and development of ideas.</td>
<td>(5) A committee structure is created to foster development of suggestions by various persons.</td>
</tr>
<tr>
<td>(6) Limited social interaction between suggestion-maker and evaluator.</td>
<td>(6) Committee structure permits give and take; suggestions evaluated where they originate.</td>
</tr>
</tbody>
</table>

Adapted from Schuster (1983, p.59)
The following chapter will examine why incentives like gainsharing may be suitable to today's business environment and explore the effects it can have on various company personnel and functions.
3.1 WHY GAINSHARING?

Initially, gainsharing was mainly implemented as a last ditch effort to increase productivity and decrease costs, thereby helping the companies through business downturns. However, today even financially sound companies implement these plans (Ross, Ross, and Hatcher, 1986; Ross Hatcher and Adams, 1985). Several reasons have been identified for prompting gainsharing implementation (Gowen, 1990; Bovino, 1992). These are: Aiding corporate financial turnarounds, improving manager/employee relationships, improving productivity, adjusting compensation to match philosophy of the firm, helping to affect organizational change and development, linking compensation to performance, replacing individual employee incentive plans, offsetting reduced wages or benefits during union negotiations, improving organizational communication, increasing trust, creating a team-like atmosphere, improving product quality, continuous improvement, and reduction, through attrition, of unneeded management and labour positions.

Gainsharing has many advantages over alternate incentive plans. First, the gainsharing bonus finds some middle ground between management's concern that employee bonuses be linked to the company well-being, and employees' concern that the bonus they get paid should fluctuate with their work performance, and not the vagaries of external variables. For example, in mining, while company profitability depends in part on somewhat uncontrollable parameters like commodity prices and exchange rates, one parameter that affects profitability and is controllable to a certain extent is cost/unit of production. Therefore, a gainsharing bonus that is based on such a parameter is likely to be tied quite closely to company
profitability while at the same time being influenced directly by employee performance. The employees will be highly motivated to perform if they can affect the bonus parameters, and if these parameters are linked to company performance, this will have positive ramifications on the company. If properly structured, a gainsharing bonus is directly related to employee performance, and is based on the key success factors for the company. In this respect, gainsharing can be superior to other systems like merit pay, where rewards are permanent regardless of future performance, profit sharing, where there can be a tenuous link between the employees' bonus and their performance, and piece-rate incentives, where individual employee goals may not correspond with organizational priorities.

A second advantage that gainsharing has is that bonuses are paid on a group basis. This promotes a sense of "oneness" amongst employees and reinforces the fact that success hinges upon how they perform as a team. Information sharing, skill sharing, and teamwork on behalf of all employees is encouraged to increase overall, not individual, performance. Because companies usually succeed or fail on the basis of group performance, it seems logical to base incentives on group performance.

Third, gainsharing is an appropriate incentive today because it addresses the changing characteristics of the work force, and is therefore better suited to motivate people. In Canada, the state of the workers has changed considerably in the past 100 years. However, in many cases the methods used to remunerate and motivate them have not. At the turn of the century, the challenges, priorities, backgrounds, and ambitions of the average worker were quite different than they are today. One explanation for this is the dearth of social security programs that existed in the early 1900's. Ninety years ago, the average worker had few pension benefits, no unemployment insurance, limited welfare plans, and no health insurance. As a result, the needs for food, shelter, and health were not secure: layoffs, old age, or health problems could severely diminish people's ability to provide these things for themselves or their families. In other words, using Maslow's motivational theory, their "level 2" needs (the
need that level 1 needs are secure) were not fulfilled, and therefore people were motivated to satisfy them. More money was the only method through which these needs could be satisfied at the time, and therefore pure monetary incentives at work were strong motivators. Today, however, things are different. In Canada, the creation of universal health care in the mid 1960's, the evolution of the old age pensions act from the 1930's to include more people and provide more substantial assistance, unemployment insurance legislation in 1940, the Canada Pension Plan in 1965, and the Canada Assistance plan in 1966 have helped to change the dynamics of the work force and altered their priorities and needs. With Maslow's level 2 needs largely satisfied by the social welfare net in Canada, people are beginning to "move up" the hierarchy of needs, and are therefore now motivated by level 3, 4, and 5 needs. Gainsharing provides a participative mechanism where employees form teams to pool their knowledge and experience to influence and develop solutions to organizational challenges. Employees belong to a team which respects their suggestions, and this helps to satisfy level 3 needs. Through the opportunity to provide ideas and contribute to the development and implementation of solutions, the skills and capabilities of employees can be recognized, thereby satisfying level 4 needs.

Herzberg's (1959) two-factor theory of motivation can also be used to explain the applicability of gainsharing plans today in the following way. The factors that used to be motivators, or satisfiers, on the job (for example, pension plans, job security, indexed wages, medical and dental plans) have now become hygiene factors. In other words, workers are dissatisfied if they are not present, but are not motivated if they are present. As these factors have shifted from being motivators to being hygiene factors, they have been replaced by new motivators. These include things like daycare, opportunities for participation and recognition, and increased responsibility. Any firm that gives employees access to these satisfiers will likely have a highly motivated work force.
Aside from acting as motivation for employees, the communication network provides an excellent training vehicle through which employees can learn about the interdependencies in the business and how each production centre contributes to the final product. With this knowledge, they will better understand how their performance impacts on the final product.

For these reasons, gainsharing represents an incentive in line with the changing personal needs and goals of today's employees. Of course, gainsharing is not appropriate in all organizational settings, nor will it help companies to fulfill all of their business strategies. For example, young dynamic companies that want to encourage individualistic performance and attract high-calibre employees may want to offer individual incentives (Booth, 1990). However, in some cases it does represent a step in the right direction for the motivation of employees in the best interest of the company.

3.2 CHARACTERISTICS FAVOURABLE TO GAINSHARING SUCCESS

From the empirical studies that have been undertaken, some organizational characteristics have been shown to enhance the chances of gainsharing plan success. In general, gainsharing works best in small companies, as it is easier to develop a team-like atmosphere with a small group. Nevertheless, the median number of employees in companies with these plans in the U.S. is 500 (Graham-Moore, 1990b), which suggests that size is not too important a characteristic (Graham-Moore and Ross, 1990a).

A certain level of trust, and positive management practices that encourage participation, stress continuous improvement, and are based on equality, must exist for gainsharing to work. After implementation, gainsharing will reinforce a good relationship between management and employees, but the implementation of a plan alone will not magically create these conditions (Graham-Moore and Ross, 1990a). These conditions are
necessary to ensure that communication is initially conducted in an open, genuine manner that fully taps employee suggestions and reinforces future communications. Initial trust will be reinforced when management adopts gainsharing as a management philosophy, and not just another pay system. If they give employees opportunities to build their knowledge, understanding, and involvement in the company, increased trust and improved operations will be the result.

Several people (Goodman 1979; Schuster 1983; White, 1979; Richardson 1985) have indicated that the presence of an internal catalyst for the plan, most preferably the CEO or other top management, can have a large effect on the probability of gainsharing success. An intensive case study by Douglas McDonald and Haytham Hodaly in 1993 of a mine in Glenrock, Wyoming also supports this position, and this study appears in Appendix 2. The implementation of a gainsharing plan is bound to meet with some opposition from both employee and management personnel, and strong leadership and perseverance during those times will help the plan last.

In industries with high task interdependencies, gainsharing usually works well because as it improves communication, workers become aware of bottlenecks in production and work to correct them. Low task interdependent jobs (for example writers, squash players, encyclopedia sellers) do not require a large degree of interaction to produce output. High interdependent jobs (for example journalists, soccer players, surgeons) require a large degree of teamwork and communication, and would benefit from an incentive that enhances these conditions.

If productivity can be influenced by people, or if work is not highly mechanized, opportunities to "work smarter" abound and gainsharing will encourage employees to take advantage of these opportunities (Schuster, 1983).

Accurate historic data is needed for setting fair bonus standards, and there should also be a market for increased productivity to avoid having to lay off employees. Alternatively, the
bonus calculation could hinge on cost parameters, thereby encouraging lower cost, and not increased, production.

In addition, changing product mixes can affect the standards against which current productivity is measured. Product mixes change when the characteristics of the product being produced changes in some way, thus requiring different levels of inputs. If work standards are not changed with the product mix, the gainsharing plan can result in unexpected (and undeserved) windfalls or cutbacks in bonus amounts. In cases where product mix changes are frequent, the management of the standards can be troublesome.

Information sharing is also crucial to gainsharing success. It will enable management to make decisions that are supported by the employees, and since they are often the "end users" of these decisions, it will likely increase decision effectiveness. With more information about management's situation, employees will probably have a better understanding of unpopular decisions. Moreover, with more information, employees will likely generate more cost saving ideas.

Table 6
Environmental Factors Conducive to Gainsharing Success

| Management and employee trust. | Accurate historic data. |
| Positive management practices. | Consistent product mix. |
| Highly placed internal catalyst. | Information sharing. |
| High task interdependencies. | Small number of employees. |
| Work subject to employees' influence. | Market capacity. |

Some of the above characteristics, for example the trust, management practices, and information sharing, are related to a somewhat amorphous concept known as "corporate culture". This culture will affect how people interact with each other, how much information is exchanged, the level of trust in the company, management practices, and the degree to
which employees will believe and support management prerogatives. As these are all factors which can have a huge influence on the success of a gainsharing plan, this subject is worthy of more investigation.

3.3 GAINSHARING AND COMPANY CULTURE

Company culture has been defined as "a system of shared values and beliefs that produce norms of behavior" (Ivancevich and Matteson, 1987). Patricia Booth (1990) says (p.4) that "to be strategically useful, an organization's compensation philosophy must be congruent with its overall value system, or corporate culture". Therefore, one would think that the culture of organizations with successful gainsharing plans, especially Scanlon and Rucker plans, exhibit qualities of participation and teamwork oriented towards achieving a shared objective. This appears to be the case. In a study of 23 firms that had experience with gainsharing plans, White (1979) found that low employee participation is associated with high levels of failure, and that low managerial confidence in participative management styles is strongly associated with failure or only marginal success. Therefore, before proceeding with a gainsharing plan, a company must first assess how well such a plan fits its current and anticipated structures and values.

A suitable culture and organizational structure must be present for gainsharing to be effective. For example, the culture must be characterized by positive management practices, where managers welcome and respect employee opinions and facilitate group idea creation and evaluation in the interests of continuous improvement. Furthermore, gainsharing will likely reinforce a culture of teamwork and participation in the following way:
This diagram explains how participation can affect employee experiences, attitudes and feelings, responses, and ultimately, company culture and performance.

Gainsharing plans rely heavily on managerial and employee attitudes and the ability of the two, in some cases, to alter their behaviors to work together (Strauss, 1990). A culture exhibiting some trust and mutual respect must be present for these plans to work. Therefore, companies that do not exhibit positive management practices and a positive labour relationship but want to implement a gainsharing plan must undertake to change the shared values and beliefs that are producing the current norms of behavior.
### 3.3.1 Changing Corporate Culture

Changing corporate culture requires that workers change their attitudes towards their jobs. According to Hunter, Davis, and Cohen (1984), attitude can be defined as an affective, evaluative, or emotional response towards an object. Attitudes change as people receive messages about the object, and the change can be modeled as a function of three variables: The attitude of the receiver to the object, the affective or evaluative content of the message, and the receiver's attitude towards the source of the message. Figure 6 will illustrate this concept more clearly.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Original attitude</th>
<th>Message source</th>
<th>Message:</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Like fighting in hockey</td>
<td>Prime Minister</td>
<td>Fighting will interrupt the game</td>
<td>Likely no attitude change</td>
</tr>
<tr>
<td>2</td>
<td>Like fighting in hockey</td>
<td>Prime Minister</td>
<td>Sets a bad example for kids</td>
<td>Attitude change possible</td>
</tr>
<tr>
<td>3</td>
<td>Like fighting in hockey</td>
<td>Don Cherry</td>
<td>Sets a bad example for kids</td>
<td>Attitude change probable</td>
</tr>
</tbody>
</table>

**Figure 6**
The Process of Attitude Change

In Figure 6 we assume that the message recipient is initially pro-fighting in hockey. In scenario 1, no attitude change is likely as the message is weak and its source is not a recognized hockey expert. In scenario 2, attitude change is possible because while the message source is not a recognized expert, the message may be perceived as a relevant one. In scenario 3, a relevant message is being delivered by a recognized hockey expert, and as a result attitude change is probable. Using this model, the ability of management to change the
attitudes of employees about their work will depend on how the employees perceive their work to begin with, the content of the message designed to induce change, and how they feel about management, the message source. Clearly then, in companies with poor labour relations and low labour morale, the prospect of changing corporate values and beliefs is a challenging one.

However, there are a lot of theories as to how management can go about changing corporate culture. Many of these (Beckhard and Pritchard 1992; Lawler 1988; Fitzgerald 1988; Kilmann 1985; Tunstall 1985; Trice and Beyer 1985) focus on developing a vision of where top management wants the company to be at some point in the future, and then communicating this to employees in such a way that they believe management's commitment to the vision and are prepared to participate in its fruition.

For example, Beckhard and Pritchard (1992) state that after developing a vision and communicating it to employees, management must identify gaps between where the company is today and where it wants to be in the future. By taking concrete steps to achieve its stated vision, management can increase its credibility in the eyes of employees immeasurably. Management must identify what has to be done, how, and by whom to fill the gaps between where the company is now and where it wants to be in the future. The authors state that corporate issues that should be addressed when filling the gaps include human resource policies, information management, financial management, organization structure, and the reward system. As we have seen, it is desirable that a suitable corporate culture exists prior to the implementation of a gainsharing plan. However, because gainsharing can have an effect on all of the corporate issues listed above with the exception of financial management, it may reinforce, and possibly drive, changes in corporate culture.

Reward policies can have a large effect on corporate culture. Many authors (Zussman 1983; Beckhard and Pritchard 1992; Allen 1985; Sethia and Von Glinow 1985) support this supposition. To provide an idea of how gainsharing can affect the culture of an organization
and to expand on the positive management practices discussed earlier, the paper "Management Practices in Learning Organizations" by McGill, Slocum and Lei (1992) will be summarized here. The degree to which gainsharing can help to create a "learning organization" will be discussed.

In their 1992 paper, McGill, Slocum and Lei describe an organization structure they believe is suited to the business environment today and indicate steps that can be taken to achieve that structure. A "learning organization" is one that can respond to new information by altering the networks used to process and evaluate information. In other words, it is an organization whose very structure is constantly evolving with its changing environment, a process otherwise known as continuous improvement. The authors feel that a learning organization is particularly suited to today's environment because as companies become more globally oriented, their success depends on an ability to "quickly and effectively respond to a myriad of changes". They describe five dimensions that should frame managerial policies in learning organizations and outline practices that can help to achieve these dimensions. The dimensions include openness, systemic thinking, creativity, personal efficacy, and empathy.

1) Openness: This means that management should be open to a wide range of perspectives, and the authors suggest two policies which help to achieve this. The first involves top management suspending the need for control and allowing management close to the production centres to formulate the hands-on policies. In other words, top management should outline the corporate goals and objectives, but should allow production managers to figure out how best to achieve them, as they are closer to the production centre and know their particular situation the best. "The need for common values replaces the need for detailed information and micro-management". The shift of authority down the management ranks is consistent with gainsharing, where production oriented personnel are empowered by being given a louder voice in production decisions and company operations.
The second aspect requires of management a cultural and functional humility. Cultural humility means that when making business decisions in foreign markets, management views the culture of that country as no less important than its own. Ethnocentric management practices will be hard pressed to satisfy consumer tastes and employee demands in foreign lands. Functional humility means that a combination of experience from all organizational functions, including engineering, marketing, accounting, finance, and human resources are important in the decision making process. The communication network associated with gainsharing can help to create functional humility by encouraging interaction between different production centres in the organization. The authors suggest five practices to promote openness:

a) Commitment to cultural and functional diversity in selection, development and promotion of personnel.

b) Use of multi-functional and cross-functional work groups.

c) Absence of jargon, turf, and "expert" domains.

d) Training in and use of conflict surfacing/resolving skills.

e) Availability of all information to all members.

2) **Systemic Thinking**: This means the ability and desire to look for connections between issues, events, and data points. This mode of operation will provide management with better knowledge of how the corporation interacts with the "outside" world, and in so doing will provide it with a competitive advantage. The authors suggest four practices to promote systemic thinking:

a) Share accurate (not white-washed) organizational history to promote a sense of temporal continuity.
b) Recognize the importance of relationships based on information, goods and services exchanges, and feelings, in addition to traditional line authority-based relationships.

c) Remove artificial distinction between line and staff.

d) Pay explicit attention to the inter-relationship between actions across the organization and between the organization and external forces.

Gainsharing plans are helpful in fulfilling c and d above. By encouraging meetings between all employees and management they help to remove artificial distinctions between line and staff personnel. Also, teamwork and cooperation between employees in different organizational work groups can payoff in improved organizational performance and therefore better bonuses. This is especially true in companies that have high task interdependencies.

3) Creativity: Creative management provides the organization with a way to respond to its changing environment, and requires both personal flexibility and a willingness to take risks. The ability to alter behaviors in response to changing conditions is vital to long-term survival. In addition, risk taking, and a "willingness to fail" are equally important to corporate growth. The stigma associated with policy failure should be replaced by a learning mechanism where each failure is seen as corporate feedback, the knowledge of which is used in developing future policies. The authors suggest the following four practices to encourage creativity:

a) Long term reward policies.

b) Mobility across divisions and functions.

c) Growth oriented personal development.

d) Supportive "clan" culture.
Under long-term reward policies, people will not be deterred from taking risks that may reduce their short term rewards, but will focus on long-term growth. Therefore, such personal rewards as promotions, salary increases, and favourable transfers should be based on long term performance. Mobility across divisions and functions will provide people with a better understanding of corporate operations, and increase their ability to formulate effective, appropriate corporate policies. Gainsharing plans support growth oriented personal development and "clan cultures" by providing employees with opportunities to give suggestions and ideas, thereby helping to fulfill their level 4 and 5 needs on Maslow's hierarchy. Also, the meetings, if conducted properly, can evolve into supportive "clan" gatherings, and fulfill Maslow's level 3 needs.

4) Personal Efficacy: This implies that managers feel they can and should learn, to better influence the direction of the company. Managers exhibiting personal efficacy are actively self-aware and proactive problem-solvers. Their active self awareness means that they are not only introspective, but also aware of the effects that their behaviors will have on others. Their proactive problem solving allows them to learn with the intent of applying this learning to solve problems before they become major issues. Personal efficacy demands clear vision from management, an appreciation that each person has something to contribute, and an ability to link learning to action.

Again, part of the philosophy of gainsharing is that each person has ideas that can help to improve the organization. Managers that exhibit personal efficacy and therefore appreciate every person's contribution to the decision making process are essential in companies using gainsharing plans.

5) Empathy: A concern on the behalf of management for bettering the human condition over time and an interest and capability in repairing strained relationships will help to foster a
learning environment. Empathy for fellow employees will help to achieve this, and can be encouraged in four ways:

a) Strong sense of ethics in dealing with employees and customers.
b) Active corporate citizenship.
c) Recognition and encouragement of employee contributions outside the workplace.
d) Willingness to take responsibility for relationships.

As outlined above, many of the factors that help to produce what McGill, Slocum and Lei (1992) describe as "Learning Organizations" can be provided by a gainsharing plan that combines an appropriate bonus calculation format with a communication network and management philosophy, thereby providing both extrinsic and intrinsic rewards. However, a gainsharing plan alone will not create a learning organization. Corporate policies regarding performance appraisal, interaction with the outside environment, and even physical office layout affect culture, and must evolve in a similar direction at an equivalent pace with the gainsharing plan. By modifying organizational practices, however, corporate culture can be changed, albeit slowly.

The above description introduces one systematic approach to changing corporate culture. Such a change will help the organization to respond to the rapidly changing business conditions occurring today. This example also reveals how gainsharing can reinforce a culture of teamwork and participation. However, even when there is at least a minimum acceptable corporate culture in which to implement gainsharing, the process of implementation is by no means an easy one. Of primary concern is the effect that the plan will have on management, employees and unions.
3.4 GAINSHARING AND COMPANY MANAGEMENT

The implementation of gainsharing plans can be highly stressful for management. Several people (Schuster 1983; Goodman 1979; Graham-Moore and Ross 1990b) have noted that middle managers can be forced to alter their management styles drastically. This phenomenon was also noted in the case study of Glenrock Coal (Appendix 2). The stress on management personnel can be especially great when a substantial change in organizational culture accompanies gainsharing implementation. For example, in some cases management styles must become less autocratic as many managers serve as chairpersons of production committees. With the assumption that the employees will work in the company's best interests, the need for supervisory management decreases, and this allows management to contribute more directly to corporate growth. Their roles develop from being supervisory to being facilitative, where the object is to organize team meetings, and provide information, direction, and encouragement to help generate ideas. However, these managers may have a lot more to lose than gain from the implementation of a gainsharing plan, for a variety of reasons.

First, as information passes down the ranks, their power base decreases (Schuster, 1983). Their subordinates begin to make work suggestions and do other tasks that used to be the domain of the manager. This may make some managerial positions redundant in the company, leading to a decrease in management personnel (Lawler, 1988).

Second, a reduced power base may also erode some of the distinction between employees and management, thus reducing some of the prestige associated with a management position.

Third, any change in management styles required by gainsharing can be very threatening, as gainsharing can demand a reversal in the way management interacts with employees. This is especially true in industries that traditionally have top-down authoritarian management. The gulf between authoritative management styles and those associated with
gainsharing, where employee suggestions are expected and solicited, information flows go both up and down the corporate ranks, and gains are measured based on group performance, is a large one. Many managers will be uncomfortable, unprepared, or unfamiliar with their new roles in the organization under gainsharing. These feelings may be compounded as gainsharing plans are often associated with increased demands, in terms of information and expertise, placed on management by employees. Managers often find themselves explaining not only what to do, but why to do it, and they may find themselves unable to respond to the increasing demands of the employees. Despite the fact that management may feel threatened by these changes, information sharing and positive management practices are essential to gainsharing success. The sharing of information by management results in better suggestions by employees, more communication between management and employees, and an increase in their mutual trust. As employees witness the implementation of their ideas, their involvement in the committees may grow. Because gains are paid on an organization-wide basis, workers are encouraged to co-operate with each other as well as with management, to advise each other and determine for themselves the most efficient way of doing things. The opportunity to interact with each other to identify problems and generate solutions creates intrinsic rewards through the recognition by one's peers and the opportunity for increased responsibility. As already stated, this opportunity hinges on management practices that encourage participation, involvement, idea exchanges, information flows, and continuous improvement (Strauss, 1990; Bovino, 1992). Therefore, if managers are unsure of how to use positive management practices, they must undergo thorough training in participative management and facilitation techniques.

Finally, there is a natural human inclination to resist change. As stated, for gainsharing to work, a management philosophy that employees have ideas of value that they can and will contribute if given the chance must be believed. Inflexible management will go through the motions of participation but not deliver the goods. This will be recognized quickly by
employees and if the situation is not changed, participation will decrease and the plans will cease to be effective. For this reason, top management must be aware of the inclination to resist change, especially when that change decreases one's perceived powers. Management, through either a lack of training or a lack of will to change, can act as a barrier to the success of a gainsharing plan, or any participative management plan, by simply not changing management styles or by not recognizing, through actions, employee contributions. An example of the need for management recognition of employee suggestions is revealed in a human resource study of the Canadian Mining industry by Employment and Immigration Canada (April, 1992). This study reported that in one case employee frustration resulted when mining management solicited equipment recommendations from employees but failed to provide them with feedback concerning the final purchase decision. Ninety percent of the employees chose one piece of equipment over the other, but the firm ignored the choice and purchased the least desired piece, without any explanation. Employee frustration developed, more from the lack of feedback than from the decision itself. If management had a truly participative approach, they would have recognized the employees' contribution and explained their reasons for choosing the least-favoured alternative, thereby helping to avoid employee frustration.

3.5 GAINSHARING AND EMPLOYEES

The philosophy of gainsharing is that people prefer to express themselves fully in all situations, and that in doing so they can be both constructive and supportive to the groups in which they are participating. This philosophy suggests that both the employees and the organization will be better off with employee participation.

In fact, the majority of literature on gainsharing supports this suggestion (Schuster, 1983; Hammer, 1988; Gowen, 1990). Empirical tests show that employee involvement
schemes like gainsharing can reduce organizational resistance to change, enhance creative problem solving, decrease employee turnover, decrease absenteeism, and improve communication, cooperation, trust, pay satisfaction, and productivity. Participation can also benefit employees through increased job satisfaction, higher motivation, and greater product knowledge. However, with all of the positive reviews of participatory management styles, very little has been written on their possible deleterious effects on employees. Baloff and Doherty (1989) identified three sources of negative consequences on employees: Peer group pressure, management coercion, and reentry difficulties.

Peer group pressure can occur when one member of a group exhibits deviant behaviors, or behaviors that are contrary to the behavioral standards of that group. For example, participation may be viewed as deviant and discouraged by one's peers in situations where it is a new activity. It is partly for this reason that the organizational culture prior to gainsharing implementation is very important. The degree of peer pressure will vary depending on the situation, but could be anything from mild chiding to blatant acts of violence, and would result in a decreased motivation to participate and work creatively in the individual. This would in turn decrease the overall effectiveness of the plan.

Management coercion, where managers "use their power to influence the participatory process or outcome in a non-participatory way" can also pressure employees. According to Baloff and Doherty, coercion is always risked unless three somewhat naive assumptions are made:

1) Managers and employees, having different amounts of power and formal authority in an organization, can work collaboratively to reach joint decisions without managers' exercise of power differentials to unduly push employees toward a desired behavior or outcome.
2) Managers will not discipline participators for their behavior or attitudes as a result of their involvement in the participation activity.

3) The employee participator believes that the managers will be neither coercive nor punitive and therefore participates in an open, sincere, and constructive manner throughout the activity.

These assumptions are least valid when traditional organizations with distinct power differentials and no history of participation adopt gainsharing plans. In these situations, management training is essential in successfully implementing a gainsharing plan. Coercion can be easily overlooked, as it is often hard to recognize. However, Baloff and Doherty name some conditions under which it is likely to occur:

1) The manager's stake in the outcome of participation is high.
2) Management has had little experience in "power sharing" with employees.
3) Power differentials are large, and management actively maintains these differences.

Reentry problems can occur when gainsharing programs cease to operate, or when spot gainsharing programs are terminated (spot gainsharing is a form of gainsharing which aims at a particular organizational problem, involves only those people directly associated with the problem, and terminates when the problem is corrected, or after a specified time period has elapsed). The reentry problems can have two sources: The participation may have been intrinsically rewarding, and therefore the return to normal operations could lead to dissatisfaction and decreased motivation, and the cessation of participation may disrupt employees' social contacts with their peer groups. Employees that desire the participation and flourish with it (in many cases the most productive employees) will be the ones most affected by reentry problems.
In addition to the factors mentioned by Baloff and Doherty, there are other aspects of gainsharing plans that will concern employees. First, employees must be given the opportunity to participate, and management must either act on the suggestions or provide reasons for not acting. This is crucial to any gainsharing plan. When employees' pay is based on work performance, they will become frustrated if they are denied opportunities to apply their ideas and improve their performance.

Second, bonus formats can emphasize the fixed and variable components of pay to varying extents. Employees who are risk averse will want a high fixed proportion of pay while those who are prepared to take a chance will want a high variable proportion of pay.

Third, employees may also perceive gainsharing as being just another carrot being dangled in front of them to induce performance. Training and positive management practices must convince them otherwise.

Finally, employees will be concerned about how their paycheques compare to industry standards and how well they are rewarded for their contributions. They will also likely want a voice in choosing new employees, to ensure the new employees will not inhibit their ability to earn gainsharing rewards.

While many studies suggest that gainsharing has positive effects on employees, it is important to bear in mind the potential problems that it can create for them. Consequently, whoever develops the plan must have a good understanding of employee dynamics. A good way to achieve this is to involve the employees in the development of the plan. This will not only make the plan more sympathetic to their concerns and give it more credibility in their eyes, but it will also give them a stake in its long-term success.
3.6 GAINSHARING AND UNIONS

There are different opinions regarding the effect gainsharing has on unions. Some people (Davenport 1950; Helfgott 1962; Ross and Ross 1990a) argue that unions should be in favour of gainsharing because they are strengthened. A common argument is that a precondition to plan implementation is management acceptance of the union as the representative of the work force and that management that tries to implement a gainsharing plan without union approval cannot expect gainsharing to work. Some even state that unions are essential to gainsharing success. The reason given for this is that without a union, workers will not feel safe enough to express their viewpoints openly, for fear that they will lose their jobs. "In the process of providing protection to workers for wages, job security, working conditions, benefits, and health and safety, the union also empowers the workers to be able to speak out on how to make their workplace more efficient" (Ken Georgetti, 1993). The presence of a union may give the employees the requisite authority to effectively communicate their knowledge and experience. Furthermore, some argue that the communication network will benefit the union and employees through greater employee recognition, an improved relationship with management and, due to their access to some of the company documentation and the improved relationship, less volatile collective bargaining sessions. Other possible union benefits are associated with the spin-offs of working with a successful operation, and include such things as an increased union membership and job security (Ross and Ross, 1990a; Gowen, 1990; Ross, Hatcher and Adams, 1985).

Others (Ross and Ross, 1990a) believe that unions are not enthusiastic about gainsharing, and that they support it only when it is offered as a wage concession during economic recessions. Reasons often cited for the lack of enthusiasm are the fears that management may try to substitute gainsharing bonuses for wage increases, management cannot be trusted in setting performance standards, peer pressure to perform may increase,
thus damaging union member's relationships, bonus calculations cannot be understood or trusted, union influence is undermined, increased productivity may allow for job cutting (Ross and Ross, 1990a; Ross, Hatcher and Adams, 1985), and union members actually have little control over the bonus measure, thus making the argument that the bonus size is in their hands illusory.

Of course, in practice the attitudes of unions to gainsharing will depend on specific situations. The key determinant of their attitudes will likely be their experiences when dealing with the company in the past. In many cases it is natural for unions to be skeptical because gainsharing plans appear to offer "something for nothing". However, it seems that employee acceptance of the plan is a more vital component than union acceptance in determining gainsharing success. In the Glenrock Coal case study given in Appendix 2, we see that despite initial union skepticism of the gainsharing concept, the majority of employees supported it when it was implemented, and it is likely this direct employee support that helped the plan to become successful. A trusting labour management relationship is integral to a gainsharing plan regardless of whether or not employees are represented by a union. In general, Ross and Ross (1990) believe that unions will support the plans if their power is not threatened, union members are not threatened, and management is honest in its reasons for implementing gainsharing.

In order to successfully implement a gainsharing plan in the presence of a union, Ross and Ross (1990a) suggest that involvement in the plan be participatory, results of the plan be shared, knowledge of anticipated costs and benefits be shared, management be responsive to union input, and the plan be separate from the union contract, to avoid collective bargaining complications. Getting the union "on-side" from the outset will greatly increase the chances of plan success. In a study of participative decision making in a union-management context, Schwarz (1989) reported that when the programs were developed by both management and unions, they were seen as being more equitable, more responsive to problems, more
motivating, and more satisfying than when management designed the programs alone. Furthermore, when there is an unlimited market for the output, management can stress that gainsharing will be used to identify bottlenecks in the production process. Employees can then be re-trained to balance the production process, thereby increasing production and avoiding labour cut-backs.

3.7 CONSIDERATIONS WHEN IMPLEMENTING GAINSHARING

The introduction of a gainsharing program into an organization can be a complicated process. Schuster (1987) outlined six steps that help to ensure successful implementation of gainsharing plans: Seminar, feasibility study, review and plan design, implementation, monitoring, and evaluation. These steps provide the broad strokes required when implementing a gainsharing plan.

Schuster says the introduction should begin with a senior-management seminar on the background and philosophy of gainsharing plans. The involvement of all senior management, and in some cases senior union representatives (Ross and Ross, 1990b) at both the head office and the plant will educate key members and provide an indication of potential problems. The outcome of the seminar will be a decision regarding further study.

The next step, feasibility, will measure the extent to which gainsharing will help to achieve organizational objectives, and the degree to which it is suited to the company. This stage will determine the fit between gainsharing and the organization by analysing the firm's structural, managerial, and financial characteristics, and comparing the projected results of a prototype plan design with the goals of the company. The characteristics considered in determining the fit of gainsharing have been discussed in section 3.2, and include the commitment of highly-placed management to the plans, the current management style, the
labour relations history, company culture, plant size, product mix and the extent to which it will affect bonus calculations, work force interdependence, work force composition (as companies with mature employees who have good pay and benefits and have met their financial commitments may be risk averse and want a high fixed wage set up), the potential of the company and market to absorb increased production, and the degree to which employee effort can further corporate objectives.

Plan design will consider which employees should participate in the plan, the amount of employee involvement desired and the communication infrastructures required for this level of communication, the specifics of bonus measurement (with particular attention paid to the ease of measurement and the ability of this measurement to gauge performance), time frame used in bonus calculations, and implementation date (it is advisable to implement the plans prior to cyclical upswings). All stages of the plan design must be approached within the framework of the overall strategic objectives of the firm, whether they are to increase productivity, improve labour relations, or address other concerns discussed in section 3.1. Furthermore, the bonus should be kept as simple as possible, to facilitate plan adoption (Ross, 1990).

The fourth step in plan introduction is the gainsharing announcement. It is important that both managers and employees understand their roles in the new organization by this point if the plan is to succeed. Company-wide education, as well as mechanisms to encourage feedback will aid implementation.

The fifth step, monitoring, will help the company be receptive to questions and complaints about the new system. The plan should be evaluated on a monthly basis for the first year, and less frequently thereafter. Monitoring will be most effective when the company is aware of the specific hazards that it faces, and has developed a consistent way to measure these hazards.
The last step, evaluation, is an ongoing process that reviews the plan in the light of changing business conditions, personnel, corporate objectives, and capital outlays. This step is essential to the long term success of the plan.

While the method recommended by Schuster for plan implementation is by no means the only one possible, it does provide a methodological, systematic approach to implementation. Such an approach will help to ensure all factors are addressed, and will greatly enhance the chances of gainsharing success. However, Schuster's method may have overlooked some important steps.

One is an employee survey (Bovino, 1992), which should be done in the feasibility stage, to measure the amount of trust and job satisfaction between company personnel. This survey will achieve several purposes.

First, it will reveal if there is a requisite amount of trust to initiate a gainsharing plan.

Second, it will provide management with an idea of what the employees consider important, and therefore may help to tailor the reward system to their needs. For example, it is reasonable to assume that different employees will react differently to gainsharing rewards, in particular the intrinsic rewards. For this reason, employee demographics and attitudes must be considered when developing the communication network so that the intrinsic rewards offered match the employees' profile.

Third, the formation of groups of management and production personnel to discuss the survey results can be cathartic for all people involved. Typically, once the process is initiated, people are keen to discuss problems they experience at work if the discussions are open, honest, and if there is no fear of retribution. Therefore, discussions of the survey will not only increase the trust and mutual understanding between management and employees, but it will be a good basis for initiating the communication basic to all gainsharing plans. After a period of time, group discussions can evolve from considering the survey to considering production-oriented problems (Bovino, 1992).
Finally, the employee survey will provide a suitable baseline to measure the degree to which changes in trust and job satisfaction have progressed after gainsharing implementation. This will be indispensable when evaluating the success of the plan in the future.

Another consideration is that management and employees must fully understand the gainsharing plan and what it means to their job. Management must be trained in positive management practices and group leadership skills for gainsharing to be effective. Ideally, they will be re-trained periodically. Employees should be trained in basic business concepts, the bonus calculation, and factors that affect the bonus calculation, for gainsharing to be effective. For example, they must understand that it is not production, but the price at which production is bought that determines company health and bonus amounts. All new hires, whether employee or management, should be trained in the responsibilities and expectations associated with gainsharing for it to succeed in the long term. In short, sufficient training will help to ensure that some of the "evils" Louden identified with piece rate plans in the early 1900's do not re-appear in gainsharing plans in the 1990's.

An additional consideration when implementing gainsharing includes determining how the plan will affect total labour costs. A key consideration is that total wages paid are sufficient enough to attract and retain the desired employees and reward them sufficiently for their efforts. Furthermore, in some cases consideration must be given to the effect that a group-based incentive may have on star performers used to earning a great deal of money under piece-rate plans. It is possible that they will not appreciate having their exemplary efforts used to subsidize the bonus of their less efficient counterpart's salaries, and will leave the firm. On the other hand, depending on the individual, they may enjoy teaching other employees better ways to do things, and therefore improve company performance. The second option represents a great opportunity for the company. Obviously, the reaction will depend on the individuals involved, but one way to manage star performers is to offer them supervisory roles, so that other employees, and the company, can benefit from their
knowledge. It is essential that management addresses all issues of concern when implementing gainsharing, especially those regarding the effect it may have on wage increases and layoffs. A statement that the plan will not directly cause any layoffs will help its overall success (Appendix 2).

3.8 GAINSHARING IN THE LONG TERM

One of the criticisms of gainsharing is that even if it does improve organizational operations, its effects disappear after the first few years (Goodman and Dean, 1990). For example, Richardson (1985) examined four participative management styles, one of which was a gainsharing plan, being used in four companies in mature industries and identified a distinct life cycle common to them all. The cycle has six stages: Becoming interested, wooing the work force, consummating the union, romantic interlude, complacency, and renewal or failure.

Becoming Interested

According to Richardson, the catalyst for a participatory management style is ideally someone in plant management, who feels that greater employee involvement in the work will result in lower unit costs. When the idea originates with plant management, the success of the plans are greater, as they are not seen as pointless directives from an out-of-touch head office. Rather, the plant management is aware of the plans upside potential, and has a stake in its success. Of course, the support of the employees and the head office is crucial; however, as commitment of site management can be the most difficult aspect of gainsharing plans, their support from the outset will enhance gainsharing success.
Wooing the Work Force

Data from Richardson's four company study suggests that the union, along with about 10% of the work force is usually negative towards these plans, while 10-20% of the work force welcomes them, with the remainder being indifferent. To win over the majority, the mutual management/employee benefits of the plans should be demonstrated, changes must be implemented (as opposed to preached), and regular crew meetings should be held to discuss operations and invite questions or comments.

Consummating Union

This stage involves getting the union on-side, and can be achieved by getting union representation in discussion groups and inviting union comments and suggestions.

Romantic Interlude

Soon after proper implementation of a participative management scheme, Richardson found that workers often expressed more interest and took more care in their work, had fewer grievances, decreased maintenance costs, increased their productivity, and provided many suggestions to improve operation efficiency. Managers therefore spent less time "fighting fires", and could devote more of their time to company, rather than personnel, related problems.

Complacency

About one to two years into the four participation programs, Richardson noticed complacency, as the management and supervisors started to take participation for granted. This complacency could be identified by any or all of the following factors: Management communicating and listening less, management making unilateral decisions when previously suggestions would have been sought, and the cessation of crew meetings. Another source of
complacency that he identified was decision paralysis, as managers wavered with employee opinions and failed to make any decisions at all. The use of participative management does not make authoritative management obsolete. To quote McGregor (1960, p.31) "If authority is the only tool in a manager's kit, he cannot hope to achieve his purposes very well, but it does not follow that he ought to throw away this tool. There are times when he will need it, when other tools will not be appropriate for his purposes". Individuals' motivation will depend on the extent to which they believe in the goals set by the company, the opportunities they have to help the company achieve those goals, and the payoff to them for helping to achieve the goals. If some people do not support these goals, the use of authority may be needed to achieve adequate production. Richardson noted that other negative things like layoffs adversely affected the plans. Chronic opponents of the participatory schemes point to problems associated with it to discredit it, thereby exacerbating the difficulties.

Renewal/Failure

The route taken in this stage depends on the ability of management to recognize complacency and implement policies that can revitalize and "institutionalize" the program.

A study by Goodman and Dean (1982) found that in companies that adopted a new form of work organization successfully, only one third of the programs lasted beyond four or five years. However, the Scanlon Plan was the most persistent of these organizational changes. Table 7 summarizes some methods that can be used to re-vitalize and maintain a gainsharing plan (Bovino, 1992).
Another consideration when evolving the plan with time is that increased employee knowledge of the business may allow, or require, changes in the plan structure. At some point in the plan life, employees may identify as closely with company profitability as with operational statistics like labour costs. At this time, depending on the industry and subject to employee acceptance and understanding, such things as return on investment or other profitability measures may be adopted as parameters to gauge work performance. If the employees' business knowledge and commitment to the firm have expanded to the point that they understand the profitability concepts and feel capable of influencing them, bonus payouts based on profitability will more closely link company performance with bonus payments. Furthermore, at some point employees may want to apply their ideas throughout the organization, and not be limited to their own production centre. Therefore, another change that may be required as the plan ages is an expansion of the team concept. Employees may eventually exhaust their supply of ideas pertaining to their own productivity centre, and at this point they can be rotated throughout other production committees. This will broaden their skills, enhance their understanding of the company's value-added chain, and encourage ideas that enhance intra-departmental operations.

In a further analysis of gainsharing plans in the long term, Goodman and Dean (1990) name five factors that affect plan institutionalization, or the degree to which the plan becomes
accepted and utilized in an organization. Institutionalization is affected by training, commitment, reward allocation, diffusion, and feedback and correction.

Training is important when the plan is implemented, after it has been in place for a while, and when new employees join the organization. There is some evidence that decreases in employee training contribute to the decline of gainsharing and similar plans (Goodman, 1979).

Commitment refers to the degree to which people get involved in the program, with high levels of commitment leading to institutionalization. Commitment can be measured by the degree to which participation is voluntary. In one study (Goodman, 1979), program decline was partially attributed to its being implemented in an organization whose work force did not desire it.

Reward allocation refers to the types of rewards offered, the links between behaviors and rewards, and the equity in reward distribution. Generally, the most institutionalized plans have both intrinsic and extrinsic rewards (Goodman and Dean, 1990), a strong link between performance and rewards, and equitable disbursement of any gains made possible through the work improvements of the employees (Goodman and Dean, 1990).

Diffusion refers to the natural spread of the program from one part of the organization to others. In large companies, program diffusion from one operation to another results in more institutionalization than implementing a "blanket" gainsharing plan that covers all of the company's operations (Goodman and Dean, 1990). This is because people in non-gainsharing plants can witness the positive effects of gainsharing prior to adopting it in their own plant, and therefore they have an easier time buying into the concept. A diffusion process that trains new participants and gradually spreads the plan throughout the organization is the recommended route to institutionalization in large companies.
Feedback and correction involves a constant monitoring of the program by the organization. Formalized evaluations of the programs, as well as mechanisms for feedback and correction will help to ensure the long term success of gainsharing plans.

The research by Richardson and Goodman and Dean will help companies to recognize when problems begin with their plans, and will give them ideas about how to overcome these problems. Moreover, it is encouraging to note that even if the plan does have a natural life cycle, where it has been successful it will have provided management with a responsive, participative employee base to work with when developing new corporate strategies for the future.

3.9 POTENTIAL PROBLEMS WITH GAINSHARING

Despite the positive reviews of gainsharing, success is not guaranteed. In fact, there are many factors that can retard the effectiveness of these plans. A dysfunctional incentive system can have disastrous effects on organizational efficiency: in deed, it can be worse than no incentive at all if it distracts people from the goals of the company or leads to poor labour relations. Most of the factors in Table 8 have already been addressed in different sections, but they will be summarized here. The factors have been noted by Gowen (1990), Bovino (1992), and Ross (1990) as reasons for problems with gainsharing plans.

The importance of company culture and management belief in the philosophy of gainsharing has already been discussed. It is crucial in developing a trusting relationship where participation is open and effective. Furthermore, it appears (Richardson, 1985; Bovino, 1992) that the majority of problems with these plans begin when management fails to continue the philosophy of the plan, or to adjust its parameters to reflect changing realities.

Other potential problems with gainsharing have been touched on earlier. These include the possibility that a group-based bonus could drive away production stars, and the
likelihood that employees will demand more information and guidance which management, either through a lack of training or desire, may not be able to provide. Furthermore, some management may allow an ancient evil, rate-cutting, to creep back into practice. This would involve the manipulation of standards such that, when production improves in one period, the standards are set higher in the following period. This will result in smaller bonuses being paid to employees, despite improved production. Before long employees will recognize the practice and produce at the rate that they believe will maximize their bonus while not encouraging management to increase the standards. In almost all cases, this will not be an optimal arrangement.

Table 8
Reasons For Gainsharing Problems

- Poor bonus formula design.
- Extended periods of low or no payouts.
- Managerial resistance to employee participation.
- Lack of continuing support from the top.
- Little perceived need to change the existing system.
- Complex bonus formula calculations that obscure the employees' understanding of a relationship between productivity and rewards.
- Productivity meetings cease or degenerate.
- Unfair management manipulation of standards to company's benefit.
- Supervisors feel threatened when sharing responsibility for initiating change with the employee participation system.
- Failure to evolve the plan as operational environment of the company changes.
- Management lacks necessary skills.
- Lack of actual openness, trust, and communication.
- Failure to explain reasons for changes to employees.
- Administration costs that exceed the benefits of the plan to the firm.
- Radical technological or product mix change.
- Dysfunctional behavior, in the form of decreasing bonus formula-related costs at the expense of greatly increasing cost factors that are not included in the bonus formula.
- Lack of stable productivity and cost measures.
- Management fails to get contributions from all employees.
- Employee apathy, due to indifference to monetary incentive or participatory system.
- Cessation of production meetings and other forms of communication due to complacency.
Another consideration is that organizational policies must reinforce the ideology of gainsharing and develop with it to remove any structural organizational hypocrisy which may detract from plan effectiveness. For example, a company that encourages participation by implementing a gainsharing plan but employs autocratic management styles is sending a mixed message to its employees.

Another potential problem associated with gainsharing is related to group dynamics. Although group decision making has many advantages over individual decision making, primarily due to its access to greater scope of knowledge and experience, it does have some weaknesses. Most of these weaknesses arise when the group is not managed effectively. Groups tend to make decisions that are more risky than those an individual would make (Myers and Lamm, 1976). The reason for this can be attributed to the tendency for opinions to be more extreme after discussion occurs (Lamm and Myers, 1978; Myers and Kaplan, 1976). Risky decisions are not necessarily a bad thing, as they may represent innovative solutions to problems confronting a firm. However, they should arise as a result of careful analysis, and not only as a result of group dynamics.

Another well documented weakness associated with group dynamics is known as "group think", and was initially discussed by Irving Janis in 1971. Group think is defined as "the deterioration of mental efficiency, reality testing, and moral judgment" in the interest of maintaining group solidarity (Janis, 1983). It typically occurs in highly cohesive groups which exhibit illusions of invulnerability, a belief in the moral righteousness of their position, a dismissal of outside information that opposes the group's viewpoints, high pressure to conform, and a feeling of unanimity in decision making. These illusions can vastly distort the group's ability to objectively evaluate alternatives and implement them effectively.

Many of these the above factors will affect the success of any firm, regardless of pay structure. However, knowledge of them, combined with ways to counteract them, will enhance the chances of gainsharing success.
CHAPTER 4 - EMPLOYEE INCENTIVES AND THE MINING INDUSTRY

This chapter will begin by providing a brief history of employee incentives in the mining industry, followed by a discussion of some of the current applications of profit sharing plans and piece-rate incentives in the industry. Finally, pertinent characteristics of the industry will be summarized and the degree to which gainsharing addresses these characteristics will be discussed.

4.1 A BRIEF HISTORY

Production incentives in mines have a long and creative history. In fact, innovative compensation schemes existed in some mines long before piece work and profit sharing became popular. An example is the system used in the mines of Cornwall and Devon in the early 1800's. The work in these mines was classified into three groups: Tutwork, or the work involved in sinking shafts, driving levels, or stoaping [sic] ground, Tribute, the work involved in raising and dressing the ore, and Dressing, extracting the excess economic ore left by the Tributors. Approximately every two months, work in the mines would cease, while the mine "captains", or managers, defined and estimated the amount and value of work to be done over the next two months. This work was then auctioned on a contract basis to the miners. A description of the bidding process follows (Taylor, 1814).

"About the middle of the day the men are summoned and assemble in considerable numbers, as not only those who worked in the mine the former two months, but all such that are in want of employ attend on these occasions, which indeed is the cause of the competition so often observed. The business begins by reading over what is called a general article, or set of rules and conditions subject to which every contract is made, and which article prescribes fines for fraud or neglect in the performance of the work. When this is read the
managing captain generally begins with the *tutwork*, and puts up a shaft or level, declaring the number of men required, and sometimes limiting the extent of the bargain to a certain depth or length...Offers are made...until noone is inclined to bid less, when the captain throws up a small stone, and declares who is the last offerer." (p. 309)

Payment for the work was made as follows.

"An account is opened at the counting house with the taker, or principle man of the [winning bidding group], wherein he is debted with the value of all tools delivered to him by the smith, and the expenses of sharpening and repairing them during the *taking*, or term of the contract, also, with the candles, gun powder, and other articles used by him and his partners, with the charges of hauling the waste to the surface, and likewise with cash advanced, called *subsist*. After the taking is out, the account is credited with the amount arising from the measurement of the ground at the agreed price, and with the tools and other articles returned unemployed. The pay-day is generally about a fortnight after the taking ends, when the balances are paid." (p. 309)

This system had some advantages, in that it "not only instigates the miner to discover and produce as much as he can, but leads him to consider every circumstance which may diminish the expence [sic] of returning it, or may enable him to produce the greatest quantity of each metal at the lowest charge of dressing as well as raising" (Taylor, 1814).

There is no question that this compensation scheme would provide each mining crew with the incentive to draw on all of its skills to extract the most profitable ore as cheaply as possible. However, it is also likely that a certain amount of secrecy will surround each crew's work, to provide information advantages at bidding time. The strong competition between crews, as their jobs are directly linked to their productivity, would also discourage the sharing of innovative ideas to enhance overall productivity. Furthermore, this plan discourages safe mining practices. While safety standards did exist, it was in the miners best interest to circumvent them when they felt they could, as the time devoted to safety could threaten their productivity, and ultimately their jobs.
A little more than 60 years after Taylor's article was written, another form of incentive, known as "sliding scales", began to appear in the British mining industry and by 1884 one quarter of all coal mines in the U.K. had one (Munro, 1885). In his paper, "Sliding Scales in the Coal Industry", Munro describes a sliding scale as "a method by which wages, based on a standard wage payable at a standard price, rise or fall an agreed percentage with every agreed rise or fall in the average price of coal at the mines, such average price having been ascertained at fixed intervals." The principle of this sliding scale, again in Munro's words, was "that the miner and Colliery owner are engaged in a common enterprise, and that the produce is to be shared between them". They were generally written as a contract between employees and employers, and signed by representatives of both groups. A scale used in Somerset in 1876 was set up such that the standard coal price was 10 shillings, and wages increased (decreased) by 7.5% as the coal price increased (decreased) by one shilling. This particular contract had a ceiling and floor set on the possible wages paid, but this was not common practice in those times.

The advantages of the sliding scales were said to be two-fold. First, they provided a "steadiness to trade" by automatically adjusting the miners' wages as the price of coal changed, thus decreasing the chances of strikes. Therefore, management resources could be devoted to business matters other than industrial disputes. Second, by helping to ensure long-term employment (as the company would not have to lay off as many people when the commodity price fell), the sliding scales provided a "steadiness to wages". Most miners no longer lived half of the year in poverty and the other half in riches, but were employed for the entire year.

The effect that these scales had on labour relations is hard to measure. On one hand, they got both parties working together and instilled the employees with at least some interest in the business of mining. On the other hand, there were alternate views on the average price of coal per period, and the price at which the standard wage is paid. Furthermore, many
employees may not have wanted to be exposed to the downside risk of the price of coal while not being able to affect the upside potential.

As incentives, these sliding scales will likely have only a minimal effect. These scales are more useful as vehicles through which to link employee wages with company profits than as incentives to improve employee performance. The cost of production will not affect wages, so labour will not have any desire to work more efficiently. Furthermore, tying wages to the commodity price may increase the employees' knowledge of the operating environment of the company, but if a participation network is not established where employees can exercise this increased knowledge, frustration is the most likely result as they will only be able to affect their pay to a very small degree. The employees' work performance will not affect their wage rates, and they will not have an opportunity to contribute their ideas to the company.

4.2 INCENTIVES USED TODAY IN CANADIAN MINING

An intensive telephone survey in early 1993 at U.B.C. of 149 operating mines in Canada is representative of the extent to which piece-rate, profit sharing, and gainsharing incentives are used today. Figure 7 indicates that 5% of Canadian mines use gainsharing plans, and during the survey an additional 7% said they have considered using these incentives. By comparison, in the U.S. a 1992 survey of the salaries, wages and benefits in the Metal, Industrial, and Coal mining industries (165 mines responded) by the Mining Cost Service, reported that 48% of the mines use incentive plans, and of these mines 26% use gainsharing plans.
The approximate breakdown of the degree to which incentives are used in open pit mines versus underground mines is as follows.

Figure 7
Incentive Plans in Canada

Figure 8
Incentive Use in Underground Mines
n=80
These charts provide an estimation of the degree to which underground and open pit mines use incentives and the types of incentives they use. The most striking result is the number of underground mines that use incentives in comparison with the amount of open pit mines that use them. The reason for this difference may well be because the difficulty in supervising people in underground mines requires that they be given extra motivation to work hard (Solski and Smaller, 1984). Another interesting result is that both piece-rate incentives and profit sharing are more common in underground mines, while gainsharing appears to be equally common in both, on a proportional basis. This may indicate that gainsharing incentives are equally applicable in both mine environments. A comparison of the results that gainsharing generates in open pit versus underground mines will be provided in the following chapter.

4.2.1 Mining and Piece-Rate Plans

Thirty percent of operating mines in Canada use piece-rate plans, making them the most popular incentives in Canadian mining. Often referred to as "production bonus", they
provide an incentive to work hard by making bonus payments contingent on the amount of work done. Although these incentives can be quite variable, a general design can proceed as follows. The time requirements for a particular job are measured using time study techniques and assuming that the job is being performed by an average qualified employee working at a normal pace under typical operating conditions (Burkett, 1981). Normal pace can be equated to walking at three miles per hour on level ground and includes a 15% allowance for relaxation, and a "typical" job may include, for example, inserting one type of rock bolt. Using these time measurements, work areas can be assigned total allowable man hours by multiplying the units to be extracted by the standard time per unit. Once the "standard" times are established, they become the benchmarks against which to measure future performance and calculate bonuses. Typically, the size of the group covered by the incentive is the smallest that can be readily identified with a measurable output (Burkett, 1981).

### Table 9
Example of Piece-Rate Calculation in a Mine

<table>
<thead>
<tr>
<th>Step</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Facts: - Standard time allowed per unit = 0.1 work hours. - Number of units = 200. - Bonus formula: 0.5(\text{percent performance} - 80%).</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Total allowable work hours (TAWH): 0.1(200) = 20 hours. Actual hours (AH) (assumed) = 16 hours.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>&quot;Percent Performance&quot; = (TAWH/AH)100% = 125%.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>Percent Bonus = .5(125% - 80%) = 22.5%.</td>
</tr>
<tr>
<td></td>
<td>Individual’s Incentive Earnings: Assume he worked 16 hours, base wage = $20.00/hour. Bonus Payout = 16 hours(20)22.5% = $72.00.</td>
</tr>
</tbody>
</table>
The standard hours allowed are expressed as a percentage of actual hours to determine the "percent performance". The bonus percentage is then calculated according to the specifications of the plan - in Table 9, 80% is subtracted from the percent performance and the result is multiplied by 0.5. Individual employee earnings are the percent bonus multiplied by the base wage and the hours charged.

Table 10 shows the actual bonus amounts paid to employees doing rock bolting at the Cominco Sullivan Mine in Kimberley, BC, according to their collective agreement that was effective from July 1990 to September 1992 (Cominco, 1990). In this case, employees are paid a fixed dollar amount per conventional rock bolt. The bonuses paid in Table 10 vary with the rock bolt length, type, and diameter, and include the time taken for the drilling and placing of bolts. The bonuses also include times for checking and setting up the equipment, all barring required and time needed to make the workplace safe, minor operator repairs, interference by engineering personnel, final clean up, and gathering of routine supplies and equipment. Finally, the rock bolts must be installed to a supervisor's specifications. Table 10 demonstrates some of the complexity in setting work standards for piece-rate contracts. Contracts for other mining duties, for example tramming, can be further complicated by switch point locations and the location of the production stope in the mine.

Burkett (1981) states that the less productive incentive miners earn at least 120% of their base rate, while the most efficient miner may earn 200% of his base rate. The average bonus earned by miners at one mining complex in Ontario was 43% in 1991. Usually, a reasonable base earning rate is guaranteed and incentive earnings are paid monthly.
### Table 10

**Bonus Payments per installed rockbolt at Sullivan Mine**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>3 ft.</th>
<th>5 ft.</th>
<th>7 ft.</th>
<th>6 ft.</th>
<th>8 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Star Plates (price per plate)</td>
<td></td>
<td></td>
<td>$1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screens (weld mesh or rolled, drift or raise) - (6x8)</td>
<td></td>
<td></td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swellex Bolts (1-3/8&quot; hole)</td>
<td></td>
<td></td>
<td></td>
<td>$3.01</td>
<td>$3.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$4.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1-1/2&quot; hole)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 3 ft.</td>
<td></td>
<td>$3.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 5 ft.</td>
<td></td>
<td>$4.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 7 ft.</td>
<td></td>
<td>$5.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Sets (without straps)</td>
<td></td>
<td></td>
<td></td>
<td>$2.92</td>
<td>$4.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$6.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(with straps)</td>
<td></td>
<td>$3.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$4.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$6.84</td>
<td></td>
</tr>
<tr>
<td>MKD Bolts (without straps)</td>
<td></td>
<td></td>
<td></td>
<td>$4.60</td>
<td>$6.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(with straps)</td>
<td></td>
<td>$4.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$6.66</td>
<td></td>
</tr>
<tr>
<td>Rebar (in grout)</td>
<td></td>
<td></td>
<td></td>
<td>$4.50</td>
<td>$5.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(in resin)</td>
<td></td>
<td>$5.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$6.26</td>
<td></td>
</tr>
</tbody>
</table>

Piece-rate incentives give employees a great deal of control over their incentive earnings and provide a very direct link between their work performance and reward. Moreover, the monthly bonus payments are closely tied to recent job performance and therefore can provide a strong reinforcement of positive work practices. For these reasons...
they can provide strong motivation to employees to work hard. There are some problems with these incentives, however.

Piece-rate plans offer only extrinsic sources of motivation to employees, as they pay individuals for their work performance but do not encourage communication and suggestion creation and evaluation. In fact, in some circumstances they may discourage suggestions if those suggestions do not bear directly on the individual's bonus, and if that individual has to sacrifice productive work time to make them.

The difficulty inherent in designing piece-rate plans is ensuring that when employees strive to maximize their own gains, they also maximize the gains accruing to the mine. This provides an indication of one of the primary weaknesses of the plans: Their design does not encourage employees to identify with the mine's goals and therefore alter their work habits when the incentive provided by the bonus and the goals of the mine differ. Piece-rate plans are designed so that employees, by maximizing their personal earnings, will indirectly work in the best interests of the company. In cases where the incentive provided by the bonus and the goals of the mine diverge, the employees will likely choose the option that maximizes their wealth. For example, if employees are earning substantial bonuses while using traditional extraction methods, they may reject innovations that would increase overall productivity but decrease their individual bonus. In this respect, worker flexibility suffers. At these times, efficiency demands that management establish new directives to re-align employee goals with mine goals. When and if a divergency between individual incentives and mine goals is recognized, its solution can be both time consuming and temporary. Any incentive that can link employee goals and behaviors directly to organizational well-being rather than making corporate health a fringe benefit of individual wealth maximization, will be self-regulating and will circumvent problems encountered when employee priorities and mine objectives do not coincide.
There has been considerable discussion and some research on the relationship between piece-rate bonuses and accidents in mines. Some argue that the increased production and competitiveness under these incentives comes at a "blood" price as miners overlook safety precautions in the interest of maximizing their gains. Some papers (Burkett, 1981) have recommended that government legislates an end to individual or small-crew incentive plans to improve the safety performance in mines. While the contention that piece-rate bonus schemes lead to increased accident rates in mines may seem reasonable, it is far from certain whether or not miners sacrifice their own safety to make more money. Some people (Hopkins, 1984) (Billette and Laflamme, 1987) point out that linking accident rates to bonuses is a complicated process as the miner's age and experience, total work time per shift, training, social pressures, and the jobs themselves must be considered, and piece-rate bonuses cannot be implicated as a major cause of mining accidents.

Piece-rate incentives have been used in mines for a long time and are jealously guarded by many miners and their representatives who are aware of the earning power associated with them. An example of this is the Sullivan Mine strike in Kimberley, BC which began in February, 1990. The company shut down the mine citing increased production costs and the decrease in the price of zinc. However, at the time there was a "widespread feeling that one of the issues in the shutdown was an ongoing labour-management conflict" (Northern Miner, 1990). The previous bonus contract had expired in October of 1989 and the company refused to negotiate a new contract, preferring to offer day-rate pay instead. It is likely that the exorbitant wages being earned by some miners prompted the company's position regarding the bonus contract. As a result of the day-rate pay policy, production between November, 1989 and February, 1990 dropped to 33% of its historic levels (Northern Miner, 1990). This drop in production was likely a retaliation for the un-renewed bonus contract, and lead to a long and costly work shutdown.
The Applications of Gainsharing Incentives in the Mining Industry
Chapter 4 - Employee Incentives and the Mining Industry

One method that companies sometimes use to decrease the money paid out under piece-rate production bonuses is to offer profit sharing plans as concessions for decreased piece-rates. This ensures that the employees will benefit if the company makes enough money, and reduces the emphasis on the piece-rate bonuses.

4.2.2 Mining and Profit Sharing

Profit sharing plans are quite popular in the Canadian mining industry today, as 17% of the operating mines use the plans either exclusively or in conjunction with other incentives. Although quite flexible, these plans typically require that the mine reach some threshold level of profits before any bonus is paid out. A minimum industry-average base wage is guaranteed, and bonus payments usually occur once per year. In some plans, employees have the choice of receiving payments immediately or deferring them.

Companies that favour profit sharing do so because it allows for large bonus payments when the company is making money, but requires only base salary expenses during hard times. In the cyclical mining industry, labour costs that decrease in down-swings can have a substantial impact on the risk profile of the mine. Management also likes the idea of tying bonuses to company performance as it is seen as a way to make the employees aware of overall company performance. With employees more in tune with the company's health, management feels that they will work harder during downturns, and be more willing to make wage concessions when needed. Furthermore, employees will be able to share in company profits when the mine is doing well.

An example of a profit sharing plan being used at a mining complex is the plan in use at the Sudbury operations of INCO Ltd. This plan was initially introduced to salaried staff in the fourth quarter of 1987, and has subsequently been expanded and modified to include other
personnel. As of June 28, 1991, over US $50 million had been distributed to participating employees. Table 11 provides an example of the profit sharing plan offered to salaried employees at INCO. Bonuses are paid to employees as a percentage of their salary when the quarterly operating earnings of Primary Metals exceeds US $20 million. The maximum payout is capped at 25% of an employee's salary.

<table>
<thead>
<tr>
<th>Primary Metals Quarterly Operating Earnings (US $M)</th>
<th>Percentage of Quarterly Base Salary</th>
<th>Primary Metals Quarterly Operating Earnings (US $M)</th>
<th>Percentage of Quarterly Base Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0</td>
<td>1.10</td>
<td>260.0</td>
<td>14.30</td>
</tr>
<tr>
<td>40.0</td>
<td>2.20</td>
<td>280.0</td>
<td>15.40</td>
</tr>
<tr>
<td>60.0</td>
<td>3.30</td>
<td>300.0</td>
<td>16.50</td>
</tr>
<tr>
<td>80.0</td>
<td>4.40</td>
<td>320.0</td>
<td>17.60</td>
</tr>
<tr>
<td>100.0</td>
<td>5.50</td>
<td>340.0</td>
<td>18.70</td>
</tr>
<tr>
<td>120.0</td>
<td>6.60</td>
<td>360.0</td>
<td>19.80</td>
</tr>
<tr>
<td>140.0</td>
<td>7.70</td>
<td>380.0</td>
<td>20.90</td>
</tr>
<tr>
<td>160.0</td>
<td>8.80</td>
<td>400.0</td>
<td>22.00</td>
</tr>
<tr>
<td>180.0</td>
<td>9.90</td>
<td>420.0</td>
<td>23.10</td>
</tr>
<tr>
<td>200.0</td>
<td>11.00</td>
<td>440.0</td>
<td>24.20</td>
</tr>
<tr>
<td>220.0</td>
<td>12.10</td>
<td>450.0</td>
<td>24.75</td>
</tr>
<tr>
<td>240.0</td>
<td>13.20</td>
<td>455.0</td>
<td>25.00</td>
</tr>
</tbody>
</table>

The profit sharing plan at INCO was not intended purely as a motivator, but as a vehicle through which employees could increase their identification with the company and share in its success (Ames, 1992). As such, the company pays its employees industry average base salaries in addition to the job benefits. Furthermore, INCO has adopted employee involvement and management training plans to improve the flow of communication and
participation in the company and allow the employees to exercise the increased interest they have in the company as a result of the profit sharing plan. However, despite the efforts at improving communication, it is questionable whether the profit sharing plan is producing the desired results. In an on site interview in August, 1992, it became clear that in some cases the profit sharing plan did not provide a strong enough incentive to miners to act in the best interests of the company.

In other profit sharing plans, there is often no explicit mention made of employee participation. Rather, it is hoped that because the bonus is tied to company financial performance, employees will become interested and participate voluntarily. While this supposition may apply to some extent, worker participation and cost control will never be what it could be. In fact, pro-active participation is less likely to occur in the mining industry than in many other industries for reasons stated earlier. Specifically, the employee has little control over company profitability and therefore has little incentive to work towards corporate objectives. Market prices, exchange rates, management decisions, and accounting practices, all of which are beyond the employees' control, can have a far greater impact on company profits than employee work performance, making employee contributions seem futile. For example, in one case employees produced adequate amounts of ore, and despite an increasing commodity price received only a very small bonus. The reason for this was that to hedge its risk, management had previously sold the commodity at a relatively low price on the futures market, resulting in less than expected profits. Needless to say, the employees were not impressed with this decision, and their faith in management's capabilities can only have diminished. When confronted with situations like this, it is easy to understand employees' perceptions regarding the tenuous link between company profitability and saving, for example, half a can of driller's grease.

Many companies combine profit sharing plans with individual piece-rate incentives. In these cases, the incentive generated by the profit sharing plan to provide suggestions, work as
a team, and implement cost-saving measures is quite small. This is because employees may have to sacrifice time they could devote to increasing their individual piece-work bonus to suggest and present ideas which may never be implemented. Furthermore, time spent trying to improve team performance is time lost pursuing a large individual bonus. This point will be particularly apparent when the individual bonus earned can represent a substantial percentage of base wages.

As profit sharing plans are not the subject of this study, they will not be considered further. However, it is useful to note that the companies contacted that use these plans realize that improved worker awareness of company objectives can have a positive impact on the bottom line. Furthermore, they are prepared to implement plans which they believe will accomplish this improved awareness.

4.3 GAINSHARING AND THE MINING INDUSTRY

In analysing the applications of gainsharing in the mining industry, the characteristics of the industry will be combined into three broad characteristics: Micro characteristics, macro characteristics, and labour characteristics. This section will reveal the major characteristics of the mining industry in Canada, and discuss how gainsharing addresses these characteristics.

4.3.1 Micro Characteristics

The micro characteristics of the mining industry include factors related to the environment in which the miners work, and factors associated with the extraction of product from the ground.
The process of efficiently converting several tons of ore into one ounce of gold requires a multitude of skills at several different production centres. One could say that there are many "customers" in a mine. For example, the blasters are the customers of the drillers, as they receive the product of the drillers, and their own productivity will hinge on the quality of the driller's work. In a similar way, put simply, muckers are the customers of the blasters, and millers are the customers of the muckers. Mine productivity depends on the ability of the production centres to transfer and transform the product as cheaply as possible. With such interdependent production, any incentive that gives each production centre knowledge of the needs of its customers and creates the desire to fulfill those needs, will have a positive effect on profitability. Theoretically, gainsharing is such an incentive, as employees are made aware of each other's needs through productivity meetings, and have an incentive to fulfill those needs and thereby benefit from increased bonuses and intrinsic rewards.

Mining is becoming more automated every day. In most cases, the miners' production no longer depends on the rate at which they can manually shovel ore into a tram. Much of the equipment can extract the ore with minimal physical exertion required by the miner. Therefore, in many cases production today depends more on the ability of the miner to work smarter, rather than harder. Incentives that encourage employees to apply themselves mentally to their jobs and ensure that employee goals correspond with those of the company will become even more advantageous as the mining industry develops more automation. In any industry technological changes can have radical effects on production and labour. The application of new technology requires changes in the standards upon which bonuses are calculated and often requires changes in the skill levels of employees. The adoption of new technology can be a daunting prospect for all employees. However, the worker flexibility and organizational communication associated with gainsharing will ease the incorporation of technological advances into operations.
All mines differ from most other businesses in that they are finite entities that are often only involved in the production of one or two products. These characteristics of mines must be taken into account during gainsharing design to aid effectiveness and prevent idea stagnation. It will be difficult to achieve employee commitment in a mine that has very limited reserves. Knowledge that the mine has reserves of one or two years may create a sense of futility among employees, and the notion of "continuous improvement" may make little sense, for obvious reasons. Because of the product homogeneity in most mines, after the gainsharing plan has operated for a while the idea pool may slowly dry up. Section 3.8 provides some suggestions that may be applicable after employees have gained knowledge and experience with the gainsharing plan. These can involve the expansion of the bonus parameters to include profitability criteria and the rotation of employees on productivity committees to enhance the team concept. Whatever methods are used to renew interest in the plans, because the product produced rarely changes, the flow of ideas to improve productivity will decrease with time, so steps must be taken to rejuvenate the plan if it is to survive in the long term.

In most cases, the factor which impacts most on a mining company's success and is largely controllable by the company is the cost per unit of producing the final product. Other factors, like commodity prices and exchange rates have a large impact on mine profitability but cannot be controlled by employees, and can be only marginally controlled by management through futures markets. If properly structured and implemented, gainsharing plans focus people's attention on those key success factors that they can control, and this will help the mine to better survive the vagaries of the market place. Furthermore, in many mines the cost of production is well monitored and relatively consistent. This helps both in setting work standards and providing information to employees about their performance.

In Canada, many mines are located in remote areas, with work schedules set up in such a way that people spend a fixed time at the mine, followed by time off in a neighboring city.
While at the mine site, employees are immersed in the mine culture. If they do not enjoy good relations with each other and company management, morale will likely be low and this will affect work performance. Gainsharing gives employees the opportunity to participate in management and share monetary rewards from improved performance. If it is appropriate to assume that employees and their companies flourish with participation, gainsharing should have a positive affect on morale.

Mining can be a dangerous business. In such an environment, policies that encourage the discussion of safety procedures and provide a positive incentive to practice them will likely have a large affect on labour relations, mine culture, and productivity. Even if we ignore the immeasurable costs of the human tragedy associated with mining accidents, the costs of unsafe practices can still be substantial. Everything from the short term outcomes like compensation costs and accident down-time to the possible long-term outcomes like poor labour relations, distrust of management, and low morale, can adversely affect mine operations and can be a direct result of poor safety practices. Some papers (Sanders et al 1976; Smith et al 1978) indicate that participative management plans have a positive effect on safety in mines. If this is true, the environment created by gainsharing plans should have positive ramifications on safety in mines. Furthermore, if the gainsharing bonus is based in part on the cost of production, the cost of accident compensation will affect the cost of production and therefore the reward payments. Consequently, both the "intrinsic" and the "extrinsic" components of gainsharing plans may encourage safe production.

Underground mining is very difficult to supervise. It is partly due to this that individual production incentives are popular, as they are perceived as instruments that can ensure that every miner works hard in the absence of supervision (Solski and Smaller, 1984). Some effort must be made to ensure that underground miners have adequate incentive to use their time effectively when working. By providing an extrinsic reward and helping employees to identify with and participate in company goals, gainsharing provides an incentive to work.
4.3.2 Macro Characteristics

The macro characteristics of mining, which include factors that are beyond the control of individual mines, also affect incentive management. One of the most notable characteristics of the mining industry which can affect incentive structure is the volatility of the commodity price. In most cases, the price at which the output is sold is subject to a large amount of variability. Thus, as stated earlier, any incentive that relies on the sales value of output, like profit sharing and some forms of gainsharing, may lead to employee frustration and apathy as their bonus would fluctuate greatly due to factors that are beyond their control.

This problem can be avoided by linking the bonus and productivity measurements to factors that the employees can control, like the cost per unit of metal produced. However, this can give rise to more difficulties, again as a result of the volatile market price. For example, in the case of stellar employee performance and poor market prices, management may encounter cash flow problems as they may not have the revenues to draw upon to pay the bonus. This likely would not be too troublesome if it was a one-time occurrence, but if that situation persisted, management may have to choose between seeking other sources to pay the bonus, and foregoing the bonus payments. In this case, the good employee performance will be resulting in less than expected losses. Therefore, it is highly advisable to pay the employees, as the company would still have their share of the employees' productivity gains to decrease the loss, and would continue to have a motivated work force, a huge asset in troubled times. In the other scenario, where there are high market prices but low labour efficiency, labour may become frustrated when they do not receive a portion of the company's large profits, and may perceive the work standards as being unfair.

Price volatility can make incentive management in the mining industry a tricky business, and gainsharing is susceptible to the problems it causes, as is any other incentive. However, by insulating the employees' bonus payments from the effects of uncontrollable
price volatility, gainsharing can create a highly motivated and productive work force which can in turn insulate the company from price volatility.

Mining is becoming more and more international every day. As countries vie for a greater share of the finite global mineral market, the competition in the market will increase. While there are many factors that can have a huge affect on a country's ability to compete that are to a large degree beyond the control of government and mining experts, for example deposit size, grade, and accessibility, other controllable factors can have a large affect on the ability to compete. Many of these, like taxation, land use policy, environmental regulations, political stability, country infrastructure, and skills availability, are beyond the realm of influence of an incentive plan and will not be addressed here. However, any incentive that can increase labour productivity and tap the full capabilities of the human resource can also increase the competitiveness of individual mines and the countries in which they are operating. It has been argued earlier (section 3.1) that in many cases gainsharing is the superior vehicle through which to achieve a motivated, productive work force.

4.3.3 Labour Characteristics

According to a human resources study commissioned by Employment and Immigration Canada (1992), people in the mining industry are well paid, and although each operation is different, in many cases the operation and production personnel have grade 12 education. There is a large amount of knowledge sharing between trades people, and training and re-training in product use is common. A large, well trained and skilled resource of production personnel should be able to participate effectively in the development and implementation of company policies. Gainsharing will allow the people to exercise their education and knowledge in a pro-active manner.
The history of labour relations in mining is quite bleak. Volatile market prices, hazardous working conditions, and autocratic management styles are not conducive to harmonious industrial relations. Gainsharing requires a participative approach to management in which information and ideas flow between employees and management, thereby increasing mutual trust, confidence, and understanding. Of course, wherever a wage bargain situation exists labour relations will be troublesome. However, wage bargaining should be a lot less troublesome in an environment where the two parties start off on cordial, honest terms.

It was argued earlier (section 3.1) that employees in general are changing. This argument applies to the mining industry and when one considers this in conjunction with the new technologies in mining which are demanding a higher-skilled work force, it becomes apparent that employee dynamics are different today than they were in previous generations. To be effective, incentives must be tailored to the needs of employees. If it is true that employees have changed, incentives used in the past may no longer be the most effective vehicle through which to maximize the efficiency of resource extraction.

A good example of a mine currently using a gainsharing plan is the Glenrock Coal mine in Wyoming, which implemented a plan in 1988 in an attempt to improve production and prevent mine closure. An extensive case study, made possible by a site visit where 76 employees and 15 management personnel were interviewed, indicates that the plan has been successful. In fact, the mine manager feels that the mine would now be closed if the plan had not been implemented. Some of the improvements at the mine include improved communication, increased knowledge of mine interdependencies, increased discussions in ways to improve mine operations, better productivity, more involvement in purchasing decisions, better relations between employees and management, improved productivity, and possibly improved safety.

A large portion of the improvement in the mine's operations has been made possible by the increased participation by the employees in the mine's business. The mine manager stated
that the employees' desire to participate had always been present, but for the most part was discouraged by management that did not listen to and act upon their suggestions.

The mine has encountered problems with the plan over the five years, however. One of the problems has been idea stagnation, as the employees' productivity improvement ideas gradually "dry up". Another problem has been the management of the bonus line, which has not been adjusted for the effects of inflation over the years. For a full discussion of the gainsharing plan at the Glenrock Coal Mine, please refer to Appendix 2.

The above overview of the characteristics of the mining industry seems to indicate that gainsharing may improve the operating efficiency in some mines. The following chapter will look at some specific applications of gainsharing plans in mines, discuss the plan structures, and conduct a preliminary examination of their effectiveness.
CHAPTER 5 - SURVEY OF GAINSHARING IN THE MINING INDUSTRY

5.1 INTRODUCTION

Despite our knowledge of characteristics that are conducive to gainsharing, there is a noted absence of theory associated with it (Milkovich, 1986; Schuster, 1983). This makes it somewhat difficult to determine *ex ante* whether gainsharing implementation will be successful in any given situation. For this reason, we will examine data collected from mines currently using gainsharing plans and draw upon what we know from their applications in other industries to discuss their applications in the mining industry.

5.2 THE SURVEY

5.2.1 Purpose:

The survey "Gainsharing in the Mining Industry" has three primary objectives. The first is to find how many mines in Canada use gainsharing plans. The second is to find what gainsharing plan structures are common in the mining industry, how they are implemented, and management techniques used in conjunction with them. The third objective is to evaluate the gainsharing plans being used.
5.2.2 Targets:

Mines that combine a group-based bonus system that covers virtually all employees and is based on parameters over which employees have control, with a communication network through which employee suggestions and opinions can be funneled and which allows information exchanges between employees and management, are considered suitable targets for the study. Plans with bonuses based on profits are not considered gainsharing for this survey because profitability is not a good indication of employee work performance in mining, for reasons already discussed in sections 1.3.2 and 4.2.2. The above definition made the identification of target mines difficult, as there is room for large variations within it. Furthermore, not all suitable targets labeled their incentives as "gainsharing plans", and some mines had incentives called "gainsharing plans" which bore little resemblance to the description above. For this reason, a telephone survey of all operating mines in Canada was conducted, to more accurately identify what incentives are used in these mines. These results were presented in section 4.2. Eight mines were identified as using gainsharing, seven of which were sent questionnaires.

Five of the seven Canadian mines that were sent questionnaires have participated in this study. Two U.S. mines have been included to increase the sample size. The Canadian mines participating are owned (in no particular order) by Placer Dome, Cominco Ltd., Syncrude Canada Ltd., Homestake Mining Company Ltd., and the Potash Company of America.

5.2.3 Method:

Two identical copies of a 12 page survey entitled "Gainsharing in the Mining Industry" (Appendix 1) were sent to each target mine, where one copy was completed by management
and the other by a "typical" employee. This typical employee was chosen by management, and the managers were asked to choose the employee who best represents worker attitudes towards the plan. Although this method suffered from potential management bias when choosing employee respondents, responses from both management and employee personnel provided a measure of the success of gainsharing plans from two different perspectives, and led to some interesting results.

5.3 CASE STUDIES

The analysis of each case will be divided into six parts. First, the mine's initial physical operating conditions will be described, along with the relationship between employees and management. In addition, the measure used by the mine for productivity will be revealed, and the objectives of the gainsharing plan will be described.

Second, because the process used to implement gainsharing can have a large impact on success, the methods used to introduce it will be discussed. This will consider who initially thought of gainsharing, who developed it, key considerations in its development, whether and how people's opinions of gainsharing were measured, training methods used in implementation, and the degree of support from management personnel for the plan.

Third, the plan structure will be discussed. This will consider the mechanics of bonus calculation, as well as the management of the calculation. The management of the calculation will consider the frequency with which standards are changed and the information provided to employees with the bonus calculations. This section will also measure the opportunities provided to employees for communication by measuring the number of meetings held, meeting attendance, management styles, and degree of information sharing.
Fourth, on-going plan management will be revealed. This will consider on-going training and evaluation methods, and may reveal practices which can lead to long-term success.

Fifth, the plan results will be discussed. These results will measure employee interest in participation, changes in management style, changes in productivity, and effects on communication, safety, labour relations, cost control, and labour costs.

Sixth, the plan will be evaluated and discussed, in view of the mine's initial operating conditions. The evaluation will primarily consider overall satisfaction with the plan, the quantitative and qualitative results, the match between plan objectives and mine key success factors, whether there are opportunities for communication and participation, whether the bonus is controllable by miners, and whether the calculation is easily understood.

This evaluation excludes one very important factor when measuring plan success, namely the ability of the plan to encourage long-term continuous improvement in the mine. The reason for this is that one survey alone is insufficient to objectively match particular plans with continuous improvement. For example, a one-year old gainsharing plan may improve mine productivity because it was well designed, managed, and implemented in a well prepared company, or simply because it is passing through the "romantic interlude" stage of Richardson's life-cycle. Based on observable results like employee and management attitudes towards the plan and changes in operating statistics, this survey would likely report these different hypothetical plans as being equally successful. Without the benefit of long-term plan results, our ability to match plan design with continuous improvement is limited. A far better indication of the long term success of these plans would be provided by a time series of "snapshots" of plan results, which would minimize the influence of extraneous factors like plan age on results, and therefore allow us to better match plan design and management with plan success. This survey provides a solid basis for further study of this type.
In order to compensate for this weakness, future plan performance will be projected based on what is known about gainsharing in other industries. This will consider on-going plan monitoring and training, as well as the factors used previously to measure plan success. Future surveys of gainsharing in these mines may substantiate or reject the projections developed here.

After describing the case studies, any trends discovered regarding the use of gainsharing will be discussed.

5.3.1 Case #1

Mine Description

This non-unionized mine consists of approximately 75 employees and has been operating for less than five years. Gainsharing was implemented a little more than one year prior to the survey, and became the first incentive system used at the mine. No other incentive plan is used in conjunction with gainsharing, and while management felt that the extraction of ore had been relatively consistent in the past, the employee respondent felt that it was not, due to changes in ore composition.

Both the management and employee respondents strongly disagreed with the statement that prior to gainsharing implementation, labour relations were very good. Furthermore, management strongly disagreed, and the employee disagreed, with the statement that "there was considerable trust between management and employees prior to gainsharing". The employee agreed that "employee participation and interest in management decisions prior to gainsharing was very high", and that "prior to gainsharing, mine development was proceeding as projected", while the management respondent disagreed with these statements.
The employee feels that the objectives of the gainsharing plan are to increase productivity, decrease costs, and promote employee involvement with incentives, while management feels it is to provide rewards to all employees for performance above a base-line norm. The production measure most commonly used at the mine is the cost per ounce of gold produced.

**Plan Implementation**

Because of the low level of mutual trust at this mine, plan implementation is a crucial step, as both management and employees must believe that communication and trust is both possible and desirable.

Management originally thought of implementing the gainsharing plan, and after educating top management on the concept of gainsharing, they developed the plan with the help of an outside consulting group. The key considerations in development included uncontrollable production variables and seasonality. Employee opinions regarding gainsharing were not solicited prior to implementation, possibly due to the reduced communication associated with a low level of trust. Management was trained by the consulting group in group facilitation skills, and both management and the consultants trained employees in group participation. This plan received a lot of support from top mine management, head office, crew chiefs, and department heads.

**Plan Structure**

**Bonus:**

The bonus at this mine is based on the cost per ounce and the number of ounces shipped. Bonuses are paid to all personnel as a percentage of wages when two month moving
averages of the cost per ounce and the number of ounces shipped outperform standards. The standards were established based on historic cost performance at different production rates. Therefore, this mine uses a bonus line and the cost per ounce required to achieve a bonus each period will vary with the production rate in that period. Bonuses are calculated monthly, and the company receives 80% of performance gains. There is no cap on the bonus payouts.

Management sets mine-wide work standards at this mine, based on historical performance data. These standards have changed once so far, due to changes in factors that are beyond the miner's control. When announcing bonuses, detailed cost and production data is circulated with the payroll, along with the reasons for payout or non-payout.

Opportunities To Communicate:

Monthly productivity meetings are held at this mine. All employees in the same production centres (usually ten to twenty people) meet with first line supervisors and usually some top mine management to discuss suggestions, management decisions, the bonus calculation, and costs. The meetings are on company time, and last for about two hours. These meetings have been accompanied by a change in management style, as managers have moved "towards coaching" to encourage employee involvement and empowerment. Employee participation is sought in management decisions like production schedules, methods of achieving production, and purchases that can affect bonus payout. All pertinent information, including goals, costs, and financial analysis is provided at the meetings. When decisions contrary to employee opinions are made, it is standard policy to provide reasons for these decisions.
On-Going Plan Management

Management is re-trained in the management styles associated with gainsharing on a quarterly basis. The management respondent states that new personnel are not trained in gainsharing, while the employee respondent states that they are. Finally, there is an annual evaluation of the gainsharing plan which consists of meetings with employees and an internal audit by management.

Results

Employee interest in productivity meetings is rated as "high" by the management respondent, and "moderately high" by the employee respondent. Moreover, the change in management styles has had positive repercussions on several "culture" related variables. Management said gainsharing had a "very positive" effect on communication between work crews, communication between work crews and management, and labour relations, and a "positive" effect on employee participation in decision making, information sharing between employees and management, safety procedures, and concern for cost control. The employee respondent stated that the plan had a "very positive to positive" effect on information sharing, labour relations, and concern for cost control, a "positive" effect on employee participation in decision making, communication between work crews, and communication between work crews and management, and a "neutral" effect on safety procedures.

Management estimated that there had been a 15% increase in productivity, a 10% decrease in safety violations, a 50% increase in suggestions, a 25% decrease in employee turnover, and a 10% increase in recovery. There had been no change in injury down-time, absenteeism, materials costs, or dilution. The employee respondent did not complete this section of the survey because he was not sure of the precise numbers, but felt there had been
improvement in productivity, costs, and recovery. When asked to indicate which factors besides gainsharing could have affected the data, management indicated an employee opinion survey had helped address problems, and the employee indicated that weather and ore-grade can affect the data.

Total labour costs have increased with gainsharing implementation, and this increase was "matched or exceeded" by a corresponding increase in mine revenues. Manpower requirements have not changed, and the monthly bonus payments have evolved as follows: 12.6%, 0.0%, 0.0%, 0.0%, 5.3%, 11.7%, 7.3%, 0.0%, 17.2%, 9.2%, 0.0%, 0.0%, 0.0%, 0.0%.

Table 12
GAINSHARING CHECK LIST- MINE #1

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are people satisfied with the plan?</td>
<td>yes</td>
</tr>
<tr>
<td>Are quantitative results positive?</td>
<td>yes</td>
</tr>
<tr>
<td>Has the plan improved mine &quot;culture&quot;?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus based on operation's key success factors?</td>
<td>yes</td>
</tr>
<tr>
<td>Is there a real opportunity to communicate?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus controllable by employees?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus understandable?</td>
<td>yes</td>
</tr>
<tr>
<td>Is training on-going?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the plan monitored?</td>
<td>yes</td>
</tr>
</tbody>
</table>

Evaluation and Discussion

Judging from the initial mine description, this mine appeared to be a somewhat marginal candidate for gainsharing. Most importantly, there was little, if any, trust between management and employees as the labour relations history was poor. Furthermore, the consistency of the extraction of ore is questionable, making the management of standards difficult. However, some advantages included the small number of employees (75) at the mine, which made it relatively easy to establish a team-like atmosphere and positive mine
culture. Moreover, since employee interest and participation in decisions was high, there was evidence that a gainsharing plan may effectively tap a substantial hidden human resource.

The gainsharing plan at this mine appears to be effective. It is clear from the structure of the meetings, the respondents' assessment of them, and the increase in suggestions, that there is an opportunity for employees to communicate. Furthermore, although the weather and ore grade can affect rewards, the bonus calculation is largely based on factors controllable by miners, and the plan gives them the incentive to increase gold production and decrease costs, and this is certainly a key success factor for the mine. Both the management and employee respondents stated that they "would advise other mining companies to install a plan like this one", and both were "satisfied" with it. Based on this information and the improvement in operating statistics, this plan would have to be considered successful.

When implementing the plan, problems with mutual trust were addressed through the gainsharing training provided to management and employees, and by a survey alluded to in a management response, where employee opinions and work related complaints were collected and discussed. The subsequent change in management style (perceived by both respondents) along with the provision of information, monthly two-hour production meetings, and participative decision making has likely reinforced the increased trust. Management seems to understand that gainsharing requires a large commitment and states that "making gainsharing work requires a large commitment from all parties. While I advise other mines to look at gainsharing plans, I tell them not to develop it if the commitment is not there."

The potential problem of the variable ore and its impact on setting work standards seems to have been partially overcome by the bonus structure and by the increase in trust at the mine. The bonus line (determined in advance based on historic data) automatically adjusts the work standard (in this case cost per ounce) to different production rates. As a result, employees can earn a bonus at the mine even when difficult, costly ore is encountered or when the weather is bad, as long as they surpass the cost per ounce performance achieved previously.
under similar conditions. Similarly, they do not receive bonuses just because they encounter favourable conditions; again, they must surpass cost per ounce performance previously achieved on similar ground. It must be noted, however, that the success of using historic information in setting work standards depends on the accuracy and the degree to which this information represents the employees' best efforts at the work place. Furthermore, the management of standards is made relatively simple in an open, trusting environment, and the employee survey and subsequent discussion of employee opinions and complaints at the mine helped to create this environment. This is an encouraging case, as a very poor employee/management relationship appears to have been changed within 1.5 years.

While the results of this plan appear very positive, it must be remembered that it is not yet two years old. Some things that may threaten plan survival include recent lack of bonuses, vulnerability of the bonus to the weather, and a possible lack of training provided to new personnel. The employee respondent states that ore grade and weather can have a very large effect on recovery, "requiring the employee to work harder even though he knows no payout can happen." However, though the plan is quite young and challenges do exist, the long-term prognosis looks good. This is because of the bonus structure, the apparent change in management style, satisfaction with the plan on behalf of both management and employees, re-training provided to management, the yearly evaluations of the plan, and the improvement in mine operations that the plan seems to have encouraged.
5.3.2 Case #2

Mine Description

This non-unionized open-pit mine consists of approximately 190 employees and has been operating for 5-10 years. Gainsharing was implemented in January of 1989 and replaced a company contributed stock-purchase plan. No other incentive is used in conjunction with gainsharing, and both respondents felt the extraction rate of ore had been relatively consistent in the past, although the management respondent noted that capital investments and equipment down-time have had a large effect on the extraction rate.

Management agreed with the statement that "prior to gainsharing implementation, labour relations were very good", while the employee disagreed with it. Furthermore, management agreed with the statements that "employee participation and interest in management decisions prior to gainsharing implementation was very high", and "there was considerable trust between employees and management prior to gainsharing", while the employee strongly disagreed with these statements. Finally, both respondents disagreed with the statement that "prior to gainsharing, mine development was proceeding as projected".

Both respondents agreed that the objectives of the gainsharing plan were to decrease costs and increase safety. The productivity measure most commonly used at the mine is the cost of gold production, and the management respondent stated that safety is included as well. Finally, the plan used at this mine is not referred to as a gainsharing plan.

Plan Implementation

The employee respondent states that management originally thought of gainsharing, while the manager states that both employees and management thought of it. Upper mine
management was educated in the concept of gainsharing prior to implementation. The employee respondent states that the plan was developed by management, while the management respondent says it was developed by both management and employees. The management respondent states that key considerations in development included suitability to employees, the labour relations history, and the existing management style, while the employee respondent states that the suitability to employees and uncontrollable production variables were important. He also states that employee opinions of gainsharing were not solicited prior to plan implementation, while the manager states that they were, although he does not answer how, or state what the results were. The management respondent states that training in the fundamentals of gainsharing, including why it was implemented and what its benefits were, was provided to both employees and management, while the employee states that they were not trained. However, both strongly agreed that the plan has received a lot of support from top mine management, head office, crew chiefs, and department heads.

**Plan Structure**

Bonuses:

The bonus at this mine is based on the cost per ounce of gold produced, production, and lost time accidents. Bonuses are paid quarterly to all personnel as a percentage of their three month salary when budget forecasts are improved upon. The gains are shared 50/50, and the manager stated that there is no cap, while the employee states that bonuses are capped at 13% of gross pay but that the cap has not yet been used. Lost time accidents decrease the amount of bonus paid out to the employees.

Both management and employees set the mine-wide work standards, based on time studies and budgeted forecasts. The standards change more than once per year, due to changes in factors beyond the miner's control, and to make the bonus size reasonable. All budget,
production, and cost figures are shared with employees to help them understand the bonus calculations.

Opportunities to Communicate:

Quarterly productivity meetings are held at the mine. Three elected employees from the same production centres meet with three managers, the mine manager, mine superintendent, and safety coordinator, to discuss the bonus calculation, suggestions, management decisions, and future challenges. The meetings are not held on company time, and they last for approximately 2-3 hours. The management respondent says that there has been no change in management styles associated with gainsharing, while the employee states that foremen "take suggestions more seriously than before". Employee participation is sought in decisions concerning production targets, safety, cost reduction, as well as general ideas. All company books are made available to employees at department meetings, crew meetings, and on bulletin boards to provide necessary information for participation. Decisions contrary to employee opinions are sometimes made, but it is standard policy to provide reasons for these decisions.

On-Going Plan Management

There is no on-going training for management in the management styles associated with gainsharing. The management respondent states that new personnel are trained in the requirements and expectations of gainsharing, while the employee respondent states that they are not. A quarterly gainsharing evaluation takes place, where management meets with employees to discuss the plan.
Results

Both respondents agree that employee interest in the quarterly meetings is "very high". Moreover, they agreed that the gainsharing plan had a "very positive" effect on safety procedures, communication between work crews, communication between work crews and management, and information sharing between employees and management. They agreed that the plan had a "positive" effect on labour relations. The management respondent felt that the plan also had a "positive" effect on concern for cost control, and employee participation in decision making, while the employee respondent felt that it had a "very positive" and "neutral" effect respectively.

Management indicated an increase in productivity, suggestions, and recovery, and a decrease in maintenance costs, machinery downtime, safety violations, lost days due to injury, absenteeism, grievances, turnover, materials costs, and dilution. However, management did not provide specific numbers. The employee did not complete this part of the survey, as he did not have the appropriate information. Developments cited by management that may have clouded the information include personnel changes in the management team. Total labour costs decreased with gainsharing implementation, and there have been no changes in manpower requirements since implementation. Quarterly bonus payments, since 1991, have proceeded as follows: 8.15%, 4.06%, 7.52%, 2.86%, 10.31%, 8.11%, 3.8%.
Evaluation and Discussion

Judging from the mine description, this mine appears to be a somewhat marginal candidate for gainsharing, due to the low trust employees placed in management and the low participation and interest they had in management decisions. Furthermore, employees perceived labour relations as being poor prior to plan implementation. However, the consistency of the extraction of ore was high, and management trusted employees and felt that the labour relations were good.

Based on the available information, the implementation of gainsharing has been positive for this company. Since the employees have "very high" interest in the production meetings, and the management style seems to have changed to be more open to suggestions, there appear to be opportunities for participation. Furthermore, a bonus based on mine production, mill throughput, cost per ounce of gold produced and safety is tied to a mine's key success factors, and is controllable by miners. Also, the management respondent was "very satisfied" with the plan while the employee was "satisfied" with it, and both feel that other mining companies should "seriously consider" implementing a gainsharing plan. Finally, the manager stated that the plan has "great positive effects in many areas - safety, production, work attitude, employee relations, and department cooperation". The employee felt that "the
plan does help to pull the different production areas together and it improves employee attitudes". Based on this information and improvements in operating statistics, this is a successful gainsharing plan.

Problems with mistrust were probably alleviated somewhat by having employees participate in setting work standards. This was likely a very important step, when one considers that employees were very mistrustful of management originally, were not asked of their opinions of the plan, and were not given an opportunity to voice their complaints in an employee survey. The change in management style perceived by the employee respondent also likely had a positive impact on trust. This is another encouraging case, as an environment initially characterized by low trust seems to be operating effectively with a gainsharing plan, which seems to have improved labour relations.

There are, however, some concerns with this plan. First, skills in participative management may erode if on-going training is not supplied. Second, only three elected employees from each production centre go to the production meetings. This may isolate other employees from the participation process. Third, if work standards change constantly to reflect all changed work parameters, the gainsharing bonus may eventually be perceived as an entitlement. If standards change all of the time, lack of bonus payout will likely be blamed on the level of the work standard, rather than employee performance.

Overall, this plan appears to have an encouraging future, especially if management can maintain their current participative style. The plan has already been in place for four years, and seems likely to continue to encourage efficient operations in the future.
5.3.3 Case #3

Mine Description

This non-unionized mine consists of approximately 380 employees and has been operating for 44 years. Gainsharing was implemented in January of 1992, and operates in conjunction with an individual production bonus for underground employees. The management respondent felt that ore extraction had not been consistent in the past due to capital investments and changes in the mining method, while the employee respondent felt the extraction rate had been relatively consistent. Both respondents stated that the mine is close to retirement.

The management respondent agreed with the statements that "prior to the gainsharing implementation, labour relations were very good", "employee participation and interest in management decisions prior to gainsharing implementation was very high", and "prior to gainsharing, mine development was proceeding as projected", while the employee respondent disagreed, was neutral (stating that there was interest in participation, but it was not highly accepted), and strongly disagreed respectively. The management respondent was neutral to the statement "there was considerable trust between employees and management prior to gainsharing", while the employee respondent disagreed with it.

The objective of the gainsharing plan is "teamwork towards better productivity" according to the employee respondent, and to "reduce unit operating costs" according to the management respondent. The management respondent stated that the "most common measure of productivity used" was the cost/ounce of gold produced, while the employee said that it was tons produced and footage advanced, perhaps reflecting the incentive produced by the underground individual incentive plan.
Plan Implementation

The management respondent states that management originally thought of and developed gainsharing, while the employee states that the employees originally thought of it, then developed it with management. Information about gainsharing was provided to upper mine management prior to gainsharing development. The employee was unaware of the key considerations when developing the plan, but the manager states that they included the suitability to employees, work force interdependence, and simplicity. The management respondent states that employee opinions of gainsharing were not solicited prior to plan implementation, while the employee respondent states that they were solicited through meetings with employee representatives, and that "probably all" the employees were in favour of it. There was no training provided with the implementation of the plan, and the employee respondent agreed, and the management respondent strongly agreed, that the plan received a lot of support from top mine management and head office, and they both agreed the plan received a lot of support from crew chiefs and department heads.

Plan Structure

Bonus:

The bonus at this mine is based on the cost per ounce of gold produced and the total production. Bonuses are paid to everyone except department heads and the mine manager on an absolute basis, when quarterly performance improves over the budget. Bonuses are split 50/50, and are capped at a maximum annual payout per employee of $5000.00. If the bonus is capped, it will be "taken into account for review of next year's plan".
The standards are based on historic data, and are set by management. These standards have not yet changed. However, an interview with a manager at the mine revealed that each year the standards would increase, so that employees must exceed previous performance to earn gains. Information shared when announcing bonuses consists of all cost and production information.

Opportunities To Communicate:

The management respondent stated that there are 2-3 hour meetings held monthly where between 15-20 management personnel and usually 50-100 employees gather to discuss "anything". These meetings were used prior to gainsharing and have not changed since its implementation. The meetings are not held on company time, and any employees can attend. The employee respondent stated that there are no "meetings held between management and the employees covered by gainsharing". No change in management style has been associated with the gainsharing plan. Employee participation is sought in decisions concerning work methods, and ideas for safety and productivity gains are sometimes sought. Usually, a statement of the problem is provided to employees, and "employees usually have enough information from work experience to contribute to the discussion/decision". Decisions contrary to employee opinions are sometimes made, but it is standard practice to provide reasons for the decisions.

On-Going Plan Management

There is no on-going training in the management styles associated with gainsharing, and new personnel are informed of, but not trained in, the requirements and expectations of gainsharing. Management states that there is an annual review of the plan, which consists of an internal audit by management, while the employee states that there is no evaluation.
Results

Employee interest in meetings (as answered by management only) could range from "low" to "very high" depending on the issues being discussed. Management stated that the plan had a "very positive" effect on information sharing between employees and management, and concern for cost control, and a "positive" effect on safety procedures, communication between work crews, communication between work crews and management, employee participation in decision making, and labour relations. The employee respondent stated that the plan had a "very positive" effect on concern for cost control, a "positive" effect on communication between work crews and management, information sharing between employees and management, and labour relations, a neutral effect on safety procedures and communication between work crews, and a negative effect on employee participation in decision making. Because the plan is young, and because several recent changes (including large-scale layoffs and capital investments) cloud results, little is known about the effect gainsharing has had on operations. There was no first quarter bonus payout, but the second quarter payout was $1350/employee.

Table 14
GAINSHARING CHECK LIST - MINE #3

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are people satisfied with the plan?</td>
<td>yes</td>
</tr>
<tr>
<td>Are quantitative results positive?</td>
<td>yes</td>
</tr>
<tr>
<td>Has the plan improved mine &quot;culture&quot;?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus based on operation's key success factors?</td>
<td>yes</td>
</tr>
<tr>
<td>Is there a real opportunity to communicate?</td>
<td>no</td>
</tr>
<tr>
<td>Is the bonus controllable by employees?</td>
<td>no</td>
</tr>
<tr>
<td>Is the bonus understandable?</td>
<td>yes</td>
</tr>
<tr>
<td>Is training on-going?</td>
<td>no</td>
</tr>
<tr>
<td>Is the plan monitored?</td>
<td>yes</td>
</tr>
</tbody>
</table>
Evaluation and Discussion

Judging from the initial mine description, this mine appeared to be a marginal candidate for gainsharing. Although labour relations and trust were quite low in the eyes of the employee, they were not abysmal. Furthermore, the fact that there was interest on behalf of employees in participation but it was not "highly accepted" indicates the presence of an untapped human resource. Some concerns, however, include the short remaining mine life, and the large number of employees.

The bonus calculation itself appears to be based on factors controllable by miners, cost per ounce of production, and this is a key success factor for the mine. The employee respondent states that he is "satisfied" with the plan, while the management respondent is "very satisfied" with it. Finally, although the plan is young, it appears from the second quarter bonus that the plan can get the results desired. Therefore, based on this information, and using these parameters to measure success, it is a successful plan.

However, a site visit revealed practices which will likely limit the plan's longevity and effectiveness. First, there has been no explicit communication network developed to support gainsharing and solicit and encourage participation, and it is doubtful that one existed prior to gainsharing. This is because the employee respondent stated that prior to gainsharing, there was interest in participation but it was not highly accepted. According to both survey's, management practices have not changed with gainsharing implementation to rectify this situation. This is likely a direct result of no change in the communication network occurring with gainsharing implementation. An example of this is the disagreement between the two respondents as to the measure of productivity most frequently used at the mine.

Second, the management practices associated with this plan make it terminal. An interview with management personnel at the mine revealed that the policy regarding gains is that quarterly performance must exceed previous performance for a gain to be realized and
bonuses to be paid. Therefore, in theory employees will eventually reach peak performance and the mine will be operating efficiently. However, this philosophy will certainly terminate the gainsharing plan. Periods of superlative performance will result in a one period bonus, but will require that employees perform even better in the future to get any bonus. This will prove extremely difficult, especially as managers were not initially predisposed to listen to employee suggestions that may improve productivity, and have not changed this style since gainsharing implementation. To this extent, the bonus is not very controllable by the employees, and does not reward them fairly for their work performance. Therefore, the employees will likely cut back on their productive efforts before maximum productivity is reached, for the same reasons that employees under piece-rate incentives did it in the late 1880's when rate-cutting was a wide-spread practice.

Third, there has been no training nor any change in management styles associated with gainsharing. Naturally, there is no on-going training in the styles, and this also makes the future of the plan look doubtful.

Finally, in the site interview, management stated that there was a return of "strong" management practices, which have made the gainsharing plan possible. The reason given was that the lack of alternate jobs available has given management a lot of power. This is hardly an example of the positive management philosophy associated with successful gainsharing plans.

The positive results associated with this plan are likely due to what Richardson referred to as the "romantic interlude" stage of participative management plans. The fact that it is given a positive evaluation emphasizes the weakness associated with the "snapshot" nature of this study. Barring any changes in the plan, it is likely that future "snapshots" would reveal quantitatively the weaknesses described above.
5.3.4 Case #4

Mine Description

This non-unionized underground mine consists of 130 total employees, and has been operating for 1.5 years. It is a fly in/fly out operation, with about 87 employees on the site at any given time. Gainsharing was implemented with mine startup, and therefore there is no data available with which to compare gainsharing results. No other incentive is used in conjunction with gainsharing. The management respondent stated that the extraction of ore has been affected by changes in mining method, and the development of more stopes, while the employee respondent stated that the extraction has been relatively consistent.

The objective of the gainsharing plan, according to management, is to "encourage increases in gold production and decreases in operating costs, compared to reasonably expected standards, by sharing those gains with employees". Another objective is to "continue to develop and reinforce the team concept, and provide the climate for an "ownership mentality" in the enterprise, on the part of employees". The employee describes the objective to be "for everyone on the property to have a hand in saving monies in their various departments in which they work to make a saving which then is distributed amongst all of the employees".

Plan Implementation

Management originally thought of implementing gainsharing in this mine, and after educating upper mine management about the concept of gainsharing, they developed it. The key considerations in development included the uncontrollable production variables, suitability to employees, work force interdependence, the existing management style, and the
competitiveness of the total pay package. Employee attitudes regarding gainsharing were not measured prior to gainsharing implementation, and no specific training was provided to management. Employees state that their training involved being advised of the goals of the plan, while management states that there were several meetings to "demonstrate calculations, explain target production logic, and operating cost budgets". Management and the employee respondent strongly agree that the plan has received a lot of support from top mine management and head office, and management agrees that it has received a lot of support from crew chiefs and department heads, while the employee disagrees with this statement.

**Plan Structure**

Bonus:

The bonus at this mine is based on the cost of production, and is the actual production (TPD * budgeted grade * actual recovery) multiplied by any positive difference between budgeted cost per ounce and actual cost per ounce. Budgeted grade is used because "fluctuations in mine grade would create swings in gainsharing unrelated to employee efforts". The employee respondent stated that the bonus calculation is a "very confusing issue as there is no set formula. This creates some distrust with the management, as they seem to change numbers at will, creating their own final payouts". Bonuses are calculated monthly, shared on a 70/30 company employee basis, and paid to employees on a percentage basis. Twenty five percent of the employees' gains are placed in a reserve fund which hedges the company from possible fluctuations in employee performance by reimbursing the mine if it experiences a productivity loss in any gainsharing period. However, the fund cannot be negative, and any positive balance is paid out at year end. The bonus is capped at 30% of earning for time worked. The mine manager and controller are the only personnel not covered by the gainsharing plan.
Management sets the work standards based on the historic data, and these standards have changed on average once per year. Management states that they have changed to reflect capital investments, and to reduce the bonus size, as production estimates at the outset of the program were too conservative. The employee states that standards change because "management does not like to make any reasonable payout for performance. Therefore, they keep upping the tonnage required to make a gain ... it becomes harder all the time".

Opportunities To Communicate:

Monthly meetings between management and employees are held on company time at this mine, and they last approximately 1.5 hours. Management personnel range from the first line supervisor to the mine manager, and about 8-12 employees attend the meetings. Employees elected by the crews attend, as well as volunteers. The employee respondent states that "as there seems to be no way to check the validity of the numbers or changes any of management's decisions, [meetings] seem pointless. Therefore, interest is low". The employee respondent states that no change in management style has been associated with gainsharing, while the management respondent states that there has been a change, as there is a very open planning and decision process which is often open to debate. The management respondent states that employee participation is sought in equipment choices, process modifications, and task methodology while the employee respondent states that "after views are expressed quite strongly...some changes in regard to ground control but it is not a common practice". The management respondent states that supervisors and management are encouraged to "communicate information to employees and discuss the job, while the employee respondent left the answer to "What information is provided to employees to augment this participation?" blank. Information is provided by word of mouth, and management states it is also provided in crew meetings. Operating decisions contrary to
employee opinions are sometimes made, and management states that it is standard policy to provide feedback to participation, while the employee respondent stated that it is not.

**On-Going Plan Management**

There is no formal on-going training in the management styles associated with gainsharing, although the management respondent states that there is "a considerable on-the-job group learning process". New personnel are trained in the requirements of gainsharing, and management states that there is a semi-annual formalized evaluation of gainsharing, which consists of an internal audit by management. The employee respondent states that there is no formalized, periodic gainsharing evaluation.

**Results**

Employee interest in the meetings is listed as "moderately high" by management and "moderately low" by the employee respondent. The management respondent stated that gainsharing has had a "very positive" effect on communication between work crews, communication between work crews and management, and information sharing between employees and management, and a "positive" effect on employee participation in decision making, labour relations, and concern for cost control, and a neutral effect on safety procedures. The employee respondent states that the plan has had a "positive" effect on safety, a neutral effect on communication between work crews, communication between work crews and management, information sharing between employees and management, labour relations, and concern for cost control, and a negative effect on employee participation in decision making. The management respondent states that the gainsharing plan has resulted in a slight increase in productivity and recovery, a slight decrease in dilution, and a good increase in total
production (influenced by increased cooperation between departments). The employee respondent states that there has been an increase in recovery. However, based on experience in other mines where individual production incentives are used he feels that the underground production with gainsharing is far less than what it could be. On the surface, he feels that it has had a positive effect.

Table 15
GAINSHARING CHECK LIST - MINE #4

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are people satisfied with the plan?</td>
<td>yes</td>
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</tr>
<tr>
<td>Is there a real opportunity to communicate?</td>
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</tr>
<tr>
<td>Is the bonus controllable by employees?</td>
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</tr>
<tr>
<td>Is the bonus understandable?</td>
<td>no</td>
</tr>
<tr>
<td>Is training on-going?</td>
<td>no</td>
</tr>
<tr>
<td>Is the plan monitored?</td>
<td>yes</td>
</tr>
</tbody>
</table>

Other factors that may cloud the data include the miners gaining more experience, and the aging of underground equipment (the costs of which have been contained somewhat because miners "don't abuse it"). There have been no changes in manpower requirements with gainsharing. The bonus payments have evolved in the following manner, where the first payment was given a base of 1.00 and each number represents an average of five months of payouts:

1.0, 1.3, 1.64, 1.81.

**Evaluation and Discussion**

This mine appears to be a reasonable candidate for gainsharing. Because gainsharing was implemented at start-up, labour relations were neutral. The same is true for the level of
trust on the site. One potential problem, however, with initiating gainsharing at mine start-up is the lack of historic information. This makes standard setting very difficult, as managers have little information as to what amount of production is reasonable. The fact that employees spend all of their time on the site for 28 days emphasizes the need for a positive mine culture, and therefore makes the development of an incentive like gainsharing desirable. On one hand, the creation of a "team like" atmosphere will be eased by the fact that only about 85 employees are on the site at one time. On the other, because employees spend fourteen days at a time away from the mine, the team-like atmosphere will be difficult to create.

Based on available information, this is not a successful gainsharing plan. This is because the bonus is not controllable by miners, as they perceive management to manipulate the standards. Furthermore, it is questionable that the plan is fulfilling the stated objective of the team concept because of management practices that do not encourage teamwork. The improved operation statistics are likely a result of Richardson's life cycle. The management respondent is "satisfied" with the gainsharing plan, and states that "there has been a notable willingness to work a little harder to avoid hiring an extra man. One of the most impressive benefits to me has been the spirit of cooperation and working towards a common goal - this has improved the overall operating efficiency. For example, traditionally there is a large gulf between miners and mill operators....we have found mill operators working very hard to supply the mine with hydraulic backfill because it is well known that ore tonnage produced is directly related to the quantity of backfill. Similarly, miners break up oversize pieces of ore rather than sending them to the mill to jam the grizzly. Mechanics and miners help each other underground etc. etc. I am convinced this "common goal" motivation is responsible for [9%] of our current production". The employee respondent, however, feels the overall idea "may have some good intentions". However, despite the fact that the bonuses are paid as a percentage of wages, he feels that the miners are inadequately compensated when one takes into account the huge effect their individual work effort has on gainsharing parameters as
compared with a "secretary in the office". This effect is magnified as equipment used at this mine is quite "physically demanding", and therefore the risk of permanent injury is greater. Finally, he believes that this plan was made possible by the poor economic times, and that "if there was a shortage of quality miners in the work place you would never have seen this plan put in place". His suggestions to rectify the situation include increasing the percentage gainshare provided to the miners, or basing the bonus on department performance.

The management respondent seems to understand the philosophy of gainsharing. He states that "Of course, the psychology of the situation dictates the results. Employees have to believe the system will work before it will work, they have to believe that as individuals they can have an impact. Credibility of management is often critically examined, the "system" must be seen to be honest and open". However, based on the employee's response, they do not believe the system would work, and the system does not seem to be honest and open. There are three primary reasons for this.

First, training was not provided to all management in the styles required for the gainsharing philosophy to work. As a result, employees perceive no change in management style, and think that crew chiefs and department heads do not support the plan. Furthermore, the employee has the perception that gainsharing has had a negative effect on participation in decision making, likely a result of the crew chiefs and department head's low support for the plan. The management respondent states that crew chiefs and department heads are encouraged to communicate information to employees to encourage suggestions, but it appears this does not occur. Without training, they may be uncertain as to how they should communicate information, and how they can facilitate participation.

Second, insufficient training was provided to employees about gainsharing. They find the bonus calculation confusing, and are likely not aware of work practices which would have a positive affect on the bonus.
Third, the bonus calculation itself is not perceived as being honest and open. This can likely be attributed to the lack of historic production information available to management, and their consequent uncertainty about reasonable work standards. Whatever the reason, the perception is that "[management] seems to change numbers at will, creating their own final payout". This type of comment is indicative of low levels of trust, which is not conducive to a gainsharing environment. If employees believe that management manipulates their bonus payouts, their incentive to perform is severely compromised.

Finally, it is disconcerting that the most common measure of productivity at the mine is tons per man shift, and not the parameter used for bonus calculation. This may distract people from the truly important key success factor, cost per ounce produced, and may cloud their perception of important performance measurements.

This mine has been generating some positive results with this plan. However, because of the problems associated with it the future is uncertain. It is clear, though, that if the problems are addressed and corrected the plan may have a long and productive future.

5.3.5 Case #5

Before commencing with the analysis of this case, it must be noted that only one copy of the survey, management's response, has been returned.

Mine Description

This non-unionized mine consists of about 4400 employees and has been operating for more than ten years. Gainsharing was implemented on July 1, 1991, and became the first and
The only incentive to be used at the mine. The extraction rate at this mine has been affected by different production process requirements.

The management respondent agrees that "prior to the gainsharing implementation, labour relations were very good" and "prior to gainsharing, mine development was proceeding as projected", and is neutral towards the statements that "employee participation and interest in management decisions prior to gainsharing implementation was very high", and "there was considerable trust between employees and management prior to gainsharing". The objectives of the gainsharing plan are to involve the employees in the business, reduce the unit cost of production, lower absenteeism, and support employee empowerment initiatives. The most common productivity measure is the unit cost of production.

**Plan Implementation**

Management and employees originally thought of implementing gainsharing at this mine, and after educating upper mine management, management developed the plan along with an outside consulting group. The key considerations in development included the suitability of the plan to employees, work force interdependence, and the existing management style. Employee opinions regarding gainsharing were not solicited prior to implementation, and no training associated with gainsharing was provided to employees, although management received an overview of the program. The respondent strongly agrees that the plan has received a lot of support from top mine management, head office, crew chiefs, and department heads.
Plan Structure

Bonus:

Bonuses are paid at this mine when quarterly unit cost targets are improved upon and these cost savings are then factored by total production. Bonuses are paid to all personnel except contract and temporary people on a percentage basis, calculated on quarterly results. The company employee split is 70/30 respectively, and there is no cap on the bonus level.

Work standards are set by management and are based on standards established in the five year long-term plan. The standards have not been changed, and all details regarding bonus calculations are shared with employees.

Opportunities To Communicate

Quarterly 4 hour meetings on company time are held at this operation. First and second line supervisors attend these meetings, as do all employees. Issues discussed in these meetings usually include employee suggestions, management decisions, and anything else of mutual interest and importance.

A change in management style has been required by gainsharing, as "in order to empower employees it is necessary for management to be more willing to listen and act on employee suggestions". Employee participation is sometimes sought in management decisions, especially those concerning allocation of overtime, changes in shift configurations, purchases of new equipment, and work methods. As much information as is required to "enable employees to significantly participate" is provided in department meetings and crew meetings. Operating decisions contrary to employee opinions are sometimes made, but it is standard policy to provide feedback to employee participation.
On-Going Plan Management

There is on-going training in the management styles associated with gainsharing, provided every two years. New personnel are not trained in the requirements or expectations of gainsharing. There is a formal review of gainsharing which will be used every two years. While this review has not yet been developed, the plan is to "involve employees to the greatest extent possible".

Results

Employee interest in the quarterly meetings was described as "moderately high" at this operation. The gainsharing plan has had a "positive" effect on communication between work crews and management, information sharing between employees and management, employee participation in decision making, and concern for cost control, and a "neutral" effect on safety procedures, communication between work crews, and labour relations.

Management estimates that there has been a 12% increase in productivity, a 30% decrease in absenteeism, and a 25% decrease in employee turnover. Factors that may cloud this data include an overall philosophy of continuous improvement being adopted, increased communication of business plans and results, significant leadership training, and the business climate and long-term outlook. It should be noted that the first three of the above four factors are theoretically associated with gainsharing plans. Manpower requirements have changed since gainsharing implementation, but this change has been unrelated to the plan, as "reduction targets were established before gainsharing". Bonus payments have evolved as follows: 0.0%, 0.0%, 3.6%, 4.5%, 1.0%.
Evaluation and Discussion

Based on management's response, this mine appears to be a reasonable candidate for gainsharing. Initial trust, and participation and interest in management decisions is neutral, and labour relations are quite good. Issues of concern, however, include fluctuations in the extraction rate of the product, and the large number of employees. A company with this many employees must be committed to a training program to ensure all personnel are knowledgeable of the plan and aware of their responsibilities and opportunities with it. The gainsharing philosophy will not spread by either word of mouth or management meetings alone in a company of this size.

Based on available information, this plan appears successful. The bonus calculation is based on organizational key success factors, the unit cost of production, and is controllable by employees. The management respondent is satisfied with the plan, and it has resulted in organizational improvements.

The structure of this plan appears to be appropriate. However, the lack of training at the implementation phase is cause for concern, as it is difficult to establish the "team concept" in any company, let alone one with 4400 employees. For this reason, it is questionable whether the employees identify with the gainsharing plan and the goals of the company, and
whether management is sufficiently trained in the styles associated with gainsharing. The answer to this question could have been provided by an employee response to the survey, which unfortunately was not returned. However, some management is cognisant of the philosophy associated with gainsharing. This is characterized by the final comment "Gainsharing will probably not work if it is not implemented as part of a strategy which focuses on continuous improvement through the harnessing of employee brain power. This necessitates a different style of leadership; one in which employee involvement is sincerely desired and rewarded".

The evaluations of the gainsharing plan will aid the long-term survival of this plan, and the same is true for on-going training in the management styles associated with gainsharing, although this is somewhat confusing as it was indicated that there was no training in the management styles associated with gainsharing in the first place. However, it is essential that all management adopt the plan as a management philosophy to fully utilize its human resources.

5.3.6 Case # 6

Mine Description

This non-unionized underground mine consists of 350 employees, and has been operating for more than 10 years. Gainsharing was implemented one year ago, and is the only incentive plan being used at the mine. Both respondents felt that the extraction of ore has been relatively consistent, although the employee states that equipment downtime and changes in ore composition can affect it.
The management respondent agreed with the statements that "prior to gainsharing implementation, labour relations were very good", and "prior to gainsharing, mine development was proceeding as projected", and was neutral to the statements that "employee participation and interest in management decisions prior to gainsharing implementation was very high" and "there was considerable trust between employees and management prior to gainsharing". The employee respondent was neutral to all of the above statements.

The objective of the gainsharing plan is to "reduce the cost/ton of product, while maintaining product quality" according to the employee respondent, and to "reduce operating costs and waste, and improve productivity and quality of work through suggestions" according to the management respondent. The most common measure of productivity used at the mine is "tons of product" according to the employee respondent, and "unit cost based on tons produced" according to the management respondent.

**Plan Implementation**

Management initially thought of implementing gainsharing, and after introducing upper mine management to the concepts, developed and implemented it. Key considerations when developing the plan included its suitability to employees, work-force interdependencies, and the labour relations history. Employee opinions of the plan were not collected prior to gainsharing implementation. Employee training consisted of one meeting to overview the program, but those employees selected for the gainsharing committees were given "in-depth insight" into the program. Management training consisted of a meeting with all managers to review the program, its goals, and the importance of support and active participation. The management respondent strongly agrees that the plan has received a lot of support from top mine management and head office, and agrees that it has received a lot of support from crew chiefs and department heads.
Plan Structure

Bonus:

The bonus at this mine is based on cost savings under a pre-determined budget. If appropriate, quarterly bonuses are paid to everyone, with the exception of three senior management personnel, on an absolute basis. Bonuses are split 50/50 between the company and employees, and 50% of the employees' share goes into a reserve pool, which reimburses the company when negative gains are made, but is distributed to the employees at the end of each year if there is a surplus.

Management sets the work standards by using historic data to create the budgets. The standards will be changing due to capital investments, changes in ore composition, mining method, and other factors beyond the miners control. Information that accompanies bonus payments consists of a detailed production and cost analysis which is posted on a bulletin board, and elected employees on the gainsharing committees can view the figures at the gainsharing meetings.

Opportunities To Participate:

There are monthly meetings held at this mine on company time between management and employees. The mine and the mill have two separate meetings. For each meeting, four management personnel representing different production centres meet with four elected employees. The meetings last for about two hours, and employee interest in the meetings is described by both respondents as moderately high. Subjects discussed in the meetings include bonus calculations, employee suggestions, management decisions, and future challenges. There has been no change in management styles associated with the gainsharing plan. Employee participation is sought in some management decisions, for example regarding equipment performance and methods of work, and it is standard policy to provide reasons for
decisions contrary to employee opinions. The gainsharing committee is responsible for conveying employee ideas to management. When asked what information is provided to employees to augment their participation, the management respondent said they provide information to assist in suggestions regarding operation improvement, while the employee respondent did not answer. The employee respondent states that information is conveyed by word of mouth and on bulletin boards, while the management respondent says that department meetings, crew meetings, and bulletin boards are used to convey information.

On-Going Plan Management

As there is no new management style, there is no ongoing training associated with the gainsharing plan for management. The management respondent states that new personnel are trained in the requirements and expectations of gainsharing, while the employee respondent states that they are not. There is a formal evaluation of the gainsharing plan, which consists of meetings with employees and an internal management audit, and it is used once per month.

Results

The two respondents agree that the plan has had a "positive" effect on communication between work crews, communication between work crews and management, information sharing between employees and management, and labour relations. The employee respondent feels it has had a very positive effect on safety procedures and concern for cost control, while the management respondent feels it has had no effect and a positive effect respectively. Finally, the management respondent feels the plan has had a positive effect on employee participation in decision making, while the employee respondent feels that it has had no effect.
Management indicated an increase in productivity and suggestions, and a decrease in maintenance costs, machinery downtime, lost days due to injury, absenteeism, and materials costs. However, management did not provide specific numbers. The employee respondent indicated a 2% decrease in productivity, a 27% decrease in machinery downtime, a 100% increase in suggestions, and a decrease in materials costs and recovery. No other developments aside from gainsharing could have affected this data. Total labour costs have decreased with gainsharing, as the work-force has been reduced by three people, and this is thought to be partly due to the gainsharing plan. Quarterly bonus payments have evolved as follows:

$145.60, 748.80, 68.32, 184.06, and a end-of-year reserve pool of 1,146.72.

| Evaluation and Discussion |

This mine appears to be a good candidate for gainsharing, as the management/employee relationship is not negative, there is an abundance of available information on historic production rates, and the extraction of ore is relatively consistent.

Based on available information, gainsharing appears to have had a positive effect on this mine. The employees have "moderately high" interest in the gainsharing meetings and the
plan has resulted in more communication between various mine departments. The bonus is tied to a mine key success factor which is controllable by employees, and quantitative results appear positive. Furthermore, both respondents state that they are satisfied with the plan and would advise other mining companies to seriously consider installing a similar plan. The monthly monitoring of the plan should help management pin-point problem areas, and will help them to adapt the plan to make it more successful, if required.

There are some concerns about this plan, however. First, there was no training for management in the participative styles associated with gainsharing. This may detract from the participative culture if managers are unable or unwilling to accept participation. In his response, the employee respondent had a neutral opinion regarding the support given the plan by crew chiefs and department heads, indicating that some training may be needed at this level. Second, only a few employees meet with management, and as a result some employees' ideas may not be given the chance to develop with discussion. Third, the employee defines productivity as "tons of product" while the gainsharing plan and the management respondent define it as the "unit cost of tons recovered". If the unit cost is indeed the most important operating parameter, this employee has yet to recognize that. This would indicate that the increased communication and information sharing has not yet resulted in common goals. Finally, the work standards change quite frequently. As already indicated, this policy may lead to the bonus being viewed as an entitlement, and may create tension if the management/employee relationship is strained.

Overall, this plan appears to have a challenging future. It is still young, and has already generated positive results. However, the problems described above, especially the lack of management training, may hinder the effectiveness of the gainsharing concept. The monthly monitoring may well identify the problems described above, and if appropriate action is taken the plan could continue to generate positive results into the future.
5.3.7 Case #7

Mine Description

This unionized open pit coal mine has been operating since 1958 and currently employs 173 people. Gainsharing was implemented in March of 1988 and is the only incentive used at the mine, with the exception of a small yearly reward for perfect attendance. Both respondents felt that the extraction rate of coal had been relatively consistent in the past.

The employee respondent strongly disagreed with the statements that "prior to the gainsharing implementation, labour relations were very good", "employee participation and interest in management decisions prior to gainsharing implementation was very high", and "there was considerable trust between employees and management prior to gainsharing". The management respondent was neutral to the first statement and disagreed with the other two statements. The employee noted that a recent reduction in the workforce was responsible for the poor labour/management relationship prior to gainsharing. Finally, both respondents felt that prior to the gainsharing plan, mine development was proceeding as projected.

Both respondents agree that the objective of the gainsharing plan is to reduce the cost per ton of the coal shipped, while the employee notes that a secondary objective is to divide any savings between employees and the company. Both respondents also agree that the most common measure of productivity at the mine is the cost per ton shipped.

Plan Implementation

The mine manager originally thought of implementing gainsharing at this mine and after educating upper mine management on the concept, developed the plan structure with an outside consulting company. The key considerations in the development of the plan included
coal variability and other uncontrollable production variables, suitability to employees, existing management style, work force interdependencies, the cost per ton of coal shipped, and which costs would be included in the bonus measurement. The management respondent states that employee opinions regarding the gainsharing plan were solicited prior to its implementation, and that 60% of the employees supported it, while the employee respondent stated that their opinions on gainsharing were not solicited.

The management respondent states that considerable training time was spent with supervisors on the concept of being a coach and leader and on how to facilitate a meeting, while the employee states that there was little training given to first line supervision, but extensive training given to upper management. The management respondent also says that there were training and orientation sessions to introduce gainsharing to the employees so they would understand what their roles were and how they could participate, while the employee respondent states that there was only minimal training offered to them.

Finally, both respondents strongly agree that the plan has received a lot of support from the mine manager and head office, and the employee respondent strongly agrees that it has received a lot of support from crew chiefs and department heads, while the management respondent agrees with this statement.

**Plan Structure**

**Bonus:**

The bonus structure at this mine is very similar to the structure in case study # 1. Specifically, a bonus is paid to all employees except the mine manager and his direct reports on a percentage basis when a combination of the two-month moving averages of the cost per ton and the tons shipped outperform standards. The standards were established based on historic cost performance at different production rates, and therefore this mine uses a bonus
line to measure performance. Bonuses are calculated monthly, are not capped, and the company receives 75% of the performance gains. The bonus standards are mine wide and have not changed since the plan was implemented. Bonus calculations and all measured costs are made available to the employees.

Opportunities to Communicate:

Monthly production meetings are held at this mine on company time, and all employees in the same production centres meet with first line supervisors to discuss suggestions, management decisions, and generate productivity improvement ideas. These meetings are mandatory and can range from 8 to 20 people. The meetings last for about one hour and are "facilitated" by either the first line supervisor or an employee who has been trained in facilitation methods. Both respondents agreed that there has been a change in the management styles used at the mine, as the management respondent says that "management must listen and respond to employees' ideas concerning improvement", and the employee respondent says that "first line supervision has become more open to suggestions from employees". Employee participation is sought in some management decisions and all measured costs and the monthly calculation information is shared with the employees. Furthermore, employees can attend vendor presentations, visit other operations, and participate in the interview process to help make the decisions. Decisions contrary to employee opinions are sometimes made, but it is common practice to provide feedback to employee participation.

On-Going Plan Management

The management respondent states that there is annual re-training in the management styles associated with gainsharing, and that new personnel are trained in the requirements and
expectations of gainsharing. However, the employee respondent disagrees with the managers position in both cases, saying that there is no re-training and no introduction to gainsharing for new personnel. Once every month there is an evaluation of the gainsharing plan conducted by the "gainsharing advisory board" which consists of an equal representation of hourly and management personnel.

**Results**

Employee interest in production meetings is rated as "moderately high" by the management respondent, and "moderately low" by the employee respondent. Both respondents strongly agree that the plan has had very positive effects on information sharing between employees and management. The management respondent feels it has also had a very positive effect on communication between work crews and management, and a positive effect on communication between work crews, employee participation in decision making, and concern for cost control. The employee respondent feels that it has had a very positive effect on concern for cost control, and a positive effect on safety procedures and communication between work crews and management. He feels it has had a neutral effect on communication between work crews, employee participation in decision making, and labour relations, while the management respondent feels the plan has had a neutral effect on safety procedures and labour relations.

Management estimated that there had been a 10% increase in productivity, a 10% decrease in maintenance costs and machinery downtime, a 100% decrease in absenteeism, a 50% decrease in dilution, and a 100% increase in the number of suggestions. He felt there had been no change in safety violations, lost days due to injury, grievances, or employee turnover. The employee respondent did not have exact figures, but guessed there was an increase in productivity and the number of suggestions, and a decrease in safety violations, absenteeism,
and materials costs. When asked to indicate whether factors other than gainsharing may have affected the data, the employee respondent stated that a reward for perfect attendance may have affected the absenteeism figures, and the management responded cited other factors like better management, economy, and higher expectations.

Labour costs have decreased with gainsharing implementation, as the manpower requirements at the mine have been reduced. The management respondent stated that the reductions had been brought on by the gainsharing plan while the employee respondent did not answer that question. The monthly bonus payout since the plan was implemented in 1988 has averaged 6.6%.

Table 18
GAINSHARING CHECK LIST - MINE #7

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are people satisfied with the plan?</td>
<td>yes</td>
</tr>
<tr>
<td>Are quantitative results positive?</td>
<td>yes</td>
</tr>
<tr>
<td>Has the plan improved mine &quot;culture&quot;?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus based on operation's key success factors?</td>
<td>yes</td>
</tr>
<tr>
<td>Is there a real opportunity to communicate?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus controllable by employees?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the bonus understandable?</td>
<td>yes</td>
</tr>
<tr>
<td>Is training on-going?</td>
<td>yes</td>
</tr>
<tr>
<td>Is the plan monitored?</td>
<td>yes</td>
</tr>
</tbody>
</table>

_Evaluation and Discussion_

The description of this mine prior to gainsharing implementation reveals a very poor labour management relationship, and this alone makes it a questionable candidate for a gainsharing plan. However, having operated for a long period of time, there was sufficient historic data with which to build an accurate bonus line. Moreover, discussions with the mine manager revealed that at the time the mine was a very marginal enterprise, and knowledge of
its imminent closure may have inspired employees and management alike to give the gainsharing plan a chance at success.

There is little doubt that this gainsharing plan has had a very positive effect on this mine. Although the employee respondent did not express a great deal of enthusiasm for the productivity meetings, the change in management style perceived by both respondents, the increase in suggestions, and the increased information sharing between employees and management has resulted in a "very positive" impact on concern for cost control, according to the employee respondent. The bonus is based on costs controllable by the miners and is tied to the historic cost per ton at different production rates. This means that the bonus payment is largely controllable by the employees, and based on factors key to the success of the mine. The management respondent is very satisfied with the plan, the employee respondent is neutral towards it, and both would advise other mining companies to install an incentive plan like this one.

This plan had been operating successfully for five years prior to this survey, and there are some clear reasons for its success.

First, prior to plan implementation, management was trained in facilitation methods and group processes. This helped to prepare them for the employee participation that was encouraged through the productivity meetings. The mine manager stated that the employees' desire to participate had always been present, but had not been encouraged by positive management practices. Having been trained in how to accept employee participation, management did not kill the participation through a lack of feedback and action.

Second, an employee survey helped to reveal criticisms of the company and subsequent discussions of the survey helped to initiate communication between employees and management. Action on employee criticisms helped to lend management some credibility.

Third, the bonus line has not changed throughout the life of the gainsharing plan. This stable work standard was very beneficial in the early years of the plan because it was never
necessary for management and employees to argue over the work standards after they were initially set, and as a result their relationship was not threatened by a combustible subject. This stability was in large part due to the bonus line, as work standards did not have to be changed with changing production rates. Lately, however, there has been some employee discontentment as they realize that inflation has been making the work standards progressively harder to achieve, and as a result the stable bonus line is beginning to threaten the plan. Shifting the bonus line to reflect inflation will appease the employees and help to preserve the employee management relationship.

Fourth, aside from the bonus line, the plan has been flexible and has adapted to suit people's preferences and plan requirements. For example, initially all first line supervisors were required to facilitate the productivity meetings. However, as the plan progressed it became apparent that some supervisors were not comfortable with this role, so employees who were eager were trained and given the responsibility of meeting facilitation. Another example is the "gainsharing advisory board". The board was developed after the plan was implemented to facilitate intra-departmental communication, ensure that all suggestions are evaluated, and maintain plan effectiveness. This board has helped to institutionalize the gainsharing plan at this mine.

Finally, upper mine management has been very committed to this plan throughout its life. This is best shown by the comments of the management respondent in the survey. "True gainsharing is not a production bonus. Productivity improvements must be able to be quantified in terms of dollars. Gainsharing requires a total and unwavering commitment by management for the long term. It needs constant attention and support. Leadership from the top is a must!"

Despite the hurdles that confront this plan in the form of bonus line adjustments and possibly waning employee interest, the commitment shown in the past to the plan and the flexibility to alter the plan suggests that it will continue to be successful into the foreseeable future.
5.4 GENERAL TRENDS

A statistical analysis of the gainsharing data will not be conducted due to the small sample size. Rather, this section will discuss and summarize the applications of these plans in the mining industry. Table 19 is constructed from the information in the previous section and summarizes the major characteristics of the plans studied.

5.4.1 Plan Design, Implementation, and Results

For the most part, these plans resemble typical gainsharing plans in that they combine communication networks with group-based bonuses contingent upon controllable parameters. In most of the mines there seems to be a genuine effort to encourage all employees to contribute their productivity improvement ideas to the mine. So far all of the plans seem to be generating positive results and all respondents are satisfied with them. However, although they can all be classified as gainsharing plans, there are some notable differences in the plan designs and the management structures that support them.

For example, mine #1 splits the productivity gains on an 80/20 company/employee basis while mines 2, 3, and 6 use a 50/50 split. While we do not have the exact amount of the productivity increases in the mines using the 50/50 split, we do know that the mines which keep a larger proportion of the gains than the employees have reported improvements in productivity. Based on this information we can conclude that, at least in the first years of the gainsharing plans, the share ratio of the gains is not a critical factor in plan design.
<table>
<thead>
<tr>
<th>Mine</th>
<th>Plan Start</th>
<th>Plan made by</th>
<th>Bonus based on</th>
<th>Bonus Cap</th>
<th>Reserve Pool</th>
<th>Share Ratio (co./empl.)</th>
<th>Payment Frequency</th>
<th>Bonus Format</th>
<th>Bonus Amounts</th>
<th>Communication Setup</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1991</td>
<td>Management and Consultant</td>
<td>Cost/unit.</td>
<td>No</td>
<td>No</td>
<td>80/20</td>
<td>Monthly</td>
<td>% of wages</td>
<td>12.6%, 0.0, 0.0, 0.0, 5.3, 11.7, 7.3, 0.0, 17.2, 9.2, 0.0, 0.0, 0.0, 0.0</td>
<td>Monthly meetings of production centres with front-line supervisors and some management.</td>
<td>Improved communication, labour relations, information sharing, cost control. 15% increase in productivity, 10% decrease in safety violations, 50% increase in suggestions, 10% increase in recovery.</td>
</tr>
<tr>
<td>2</td>
<td>Jan., 1989</td>
<td>Primarily Management</td>
<td>Cost/unit and lost time accidents</td>
<td>Yes</td>
<td>?</td>
<td>50/50</td>
<td>Quarterly</td>
<td>% of wages</td>
<td>8.15%, 4.06, 7.52, 2.86, 10.31, 8.11, 3.8</td>
<td>Quarterly production meetings - elected employees from each production centre meet with top management.</td>
<td>Increase in productivity, recovery, suggestions, cooperation, and safety.</td>
</tr>
<tr>
<td>3</td>
<td>Jan., 1992</td>
<td>Primarily Management</td>
<td>Cost/unit and safety</td>
<td>Yes</td>
<td>No</td>
<td>50/50</td>
<td>Quarterly</td>
<td>Equal Amount</td>
<td>$0.00, $1,350.00</td>
<td>Monthly mine-wide meetings.</td>
<td>Productivity increase, more cooperation and information sharing.</td>
</tr>
<tr>
<td>4</td>
<td>March, 1991</td>
<td>Management</td>
<td>Cost/unit.</td>
<td>Yes</td>
<td>Yes</td>
<td>70/30</td>
<td>Monthly</td>
<td>% of wages</td>
<td>(First ptnt. = base of 1.00): 1, 1.3, 1.64, 1.81</td>
<td>Elected employees meet monthly with management personnel.</td>
<td>Improved productivity, recovery, and total production, modest decrease in dilution, improved cooperation.</td>
</tr>
<tr>
<td>5</td>
<td>July, 1991</td>
<td>Management</td>
<td>Cost/unit.</td>
<td>No</td>
<td>Yes</td>
<td>70/30</td>
<td>Quarterly</td>
<td>% of wages</td>
<td>0.0%, 0.0, 3.6, 4.5, 1.0</td>
<td>Quarterly meetings between first and second-line supervisors and all employees.</td>
<td>12% increase in productivity, 30% decrease in absenteeism, 25% decrease in employee turnover.</td>
</tr>
<tr>
<td>6</td>
<td>Jan., 1992</td>
<td>Management</td>
<td>Cost/unit.</td>
<td>No</td>
<td>Yes</td>
<td>50/50</td>
<td>Quarterly</td>
<td>Equal Amount</td>
<td>$145, 748, 68, 184, (reserve pool pay = 1146)</td>
<td>Monthly mine and mill meetings between management and employees.</td>
<td>Increased concern for cost control, more information sharing and communication, improved labour relations.</td>
</tr>
<tr>
<td>7</td>
<td>March, 1988</td>
<td>Management and consultant</td>
<td>Cost/unit.</td>
<td>No</td>
<td>No</td>
<td>75/25</td>
<td>Monthly</td>
<td>% of wages</td>
<td>Averaged 6.6% since beginning</td>
<td>Monthly meetings of production centres with front-line supervisors.</td>
<td>10% increase in productivity, 100% increase in suggestions, large increase in concern for cost control.</td>
</tr>
</tbody>
</table>
Furthermore, the presence of bonus caps and reserve pools appears to have little impact on plan success. Mines 1 and 7, which have neither a bonus cap nor a reserve pool, appear to be just as successful as mines that have one or both of these components. Additional surveys will help to reveal the effect that these components have on operations as the gainsharing plans age. It is possible that if bonus payments are tightly linked to factors controllable by employees, if a bonus line is used to automatically adjust work standards to changing operational conditions, and if bonuses are based upon a moving average of two to four months' results, both the bonus cap and reserve pool will be redundant in the bonus formula. In these cases, their presence may just increase the complexity of the bonus calculation.

The communication networks used in these mines are quite variable. Some mines (for example mines 1 and 7) have monthly meetings on company time between a small number of employees and first line management personnel who work in the same production centres, while other mines (for example mine 2) have quarterly meetings between elected employees and top mine management outside of company time.

It is not surprising that these differences in plan designs have little effect on the success of the gainsharing plans at the above operations. After all, gainsharing is more of a philosophy than a generic plan design, and each plan must be tailored to its environment. One would, however, expect to find significant differences in the effectiveness of the gainsharing plans in those situations where the philosophy behind the plan structure is different. While most of these mines share the same philosophy, there are some (for example #3) that do not seem to embrace the gainsharing concept. In mine #3, the management style being used may be the most appropriate one under the circumstances and may improve operations, but it is not one that will be conducive to the operating environment that all gainsharing plans strive for.

Despite the requirement that all plans be customized to their environment, however, there do seem to be some trends developing with the gainsharing plans in Table 19 that may not be appropriate to their applications in mines.
First, most of the above plans pay bonuses quarterly. Some theorists suggest that frequent rewards can better reinforce positive behaviors because they are more closely linked in time to the behaviors in question (Mawhinney and Gowen, 1990). If this is true, increased motivation may result if payments are made monthly instead of quarterly. If the mine does not want to expose itself to monthly efficiency spikes and troughs it could base monthly bonus payments on a moving average of the previous two to four months' performance parameters. This will stabilize bonus payments and provide more frequent reinforcement to employees.

Second, most mines periodically establish one cost parameter from historic productivity data which must be surpassed in order to generate gainsharing rewards. These mines do not use a bonus line and therefore require that management adjusts the cost parameter to reflect changing budgeted production levels and associated cost levels. In some instances, this inflexibility can terminate the plan. For example, the Sigma mine implemented a gainsharing plan in 1990, and although everyone at the mine was satisfied with it, they canceled it at the end of 1992. This was because changing ore grades necessitated a change in the work standards, but the mine did not know what production and associated cost levels to expect in the new ore. Instead of adopting a bonus line (perhaps legitimately if they had previously always had homogenous ore), they chose to cancel the plan. In some cases single cost parameters can be the most desirable method of setting work standards if a large amount of trust exists between management and employees, if the extraction environment is homogenous, or if there is not a great deal of accurate historic production information available with which to construct a bonus line. However, in cases where accurate historic production information is available, a bonus line will minimize the need for management to adjust the work standard and this will lend the plan some credibility in the eyes of the employees. This advantage of the bonus line is especially useful in environments such as some of the mines surveyed where there is little initial mutual trust between employees and management. In the absence of a bonus line, frequent adjustment of the work standards will
be required and this will be viewed with skepticism by employees and will threaten plan success.

Combinations of single cost parameters with quarterly production meetings can be especially dangerous to gainsharing plans, depending on the environment in the mine. The single cost parameters will likely require frequent adjustments by management, and the quarterly meetings may not be frequent enough to teach employees about the bonus calculation and the ways in which the work standards are set. In these cases, there is a chance that employees will perceive management to be meddling with the bonus payouts, and the link between their work performance and their bonuses may be weakened, thus decreasing the incentive to work well.

Third, most of the plans have been developed primarily by management with little input from employees. Furthermore, with the possible exception of mines 2, 3, and 7, employees were never questioned as to whether they wanted a gainsharing plan or felt they could contribute to it. Employee involvement in the development of the plan will help to train management in the participatory styles needed for gainsharing, ensure that the plan is suitable to employees, and give the employees a stake in its success.

Finally, while Table 19 provides some information on the communication setup in these mines, it cannot be concluded that a significant amount of pro-active communication exists simply because a network is in place. Pro-active communication in the mines is aided by the communication network, but it is contingent on a management team that encourages participation, information dissemination, feedback, and action and an employee group that understands the mine's key success factors and feels partly responsible for its success. In such an environment the credibility and effectiveness of the meetings will be very high. However, a communication network by itself, regardless of its design, will not create the management practices that are fundamental to effective gainsharing plans, or instill in employees greater knowledge of mine key success factors. Therefore, intensive training is required to help
encourage these qualities and fertilize the communication. However, in most of the Canadian mines surveyed there was not a great deal of training associated with gainsharing implementation. This may explain a surprising result obtained by the survey. In mines 3 and 4, the employee respondents stated that the gainsharing plans had a negative effect on employee participation in decision making, and the employee respondents in mines 2 and 6 said the plans had a neutral effect. The results are not ones that should be associated with healthy gainsharing plans and indicate that there are some shortcomings in these particular applications. Because of the importance of the management philosophy in gainsharing success and the gulf that often exists between this philosophy and typical management practices in mines, inadequate training and preparation may be one of the most dangerous trends developing in gainsharing applications in Canadian mines.

There are, however, some encouraging trends associated with these gainsharing plans. First, virtually all of the mines use a combination of the cost per ounce and total production to measure work performance. This ties the bonuses to factors that are both controllable by employees and key to the success of the mine. Consequently, employees are encouraged to identify with the success of the mine and work in its best interests.

Second, all of the programs have generated positive results, for example increased communication, increased knowledge of mine interdependencies, improved safety practices, and increased concern for cost control. Whether because of well-designed plans or simply because the plans are following Richardson's life cycle, productivity has improved in all of the mines surveyed. Part of the increases in productivity in the mines studied could be attributed to the "Hawthorne Effect". This effect was noted in the 1920's when some Harvard efficiency experts were hired to evaluate worker performance in a plant in Hawthorne, Illinois. Six women in the plant participated in the study by working under different conditions while the researchers measured productivity changes. The researchers found that productivity increased with every change that they made, including changes in the payment system and the work
schedule. However, when they switched back to measure the productivity under the initial conditions, the employees' performance continued to improve. It was concluded that the extra attention and privileges unintentionally given to the women had affected their productivity, and not the changes in the working conditions that the researchers had intentionally created. "The women felt special because their advice was sought and attended to throughout the study, which was a very unusual experience in those days. The women reacted to this pleasant change by working harder and producing at a higher level." (Brigham, 1986).

A similar phenomenon may be occurring in the mines with gainsharing plans, as these plans require that management seeks and attends to the advice of the employees, and this is an unusual experience in some mines today. This may lead to a productivity increase in the first couple of years for all of the plans if employees believe their advice is valued by management. After this point, the plans may reach a critical juncture where continued success depends upon the degree to which management continues to seek and attend to advice. The Hawthorne effect may help to explain the romantic interlude, complacency, and renewal/failure stages of Richardson's life cycle. Nevertheless, whatever the reasons for productivity increases, it appears that the gainsharing plans have had a positive effect on the mines in which they are used.

Third, a couple of the above mines (mines 1 and 7) invested considerable time and money in training personnel about the requirements and expectations of gainsharing. This indicates that they are aware that the gainsharing philosophy requires work and time if it is going to be effective, and signifies a recognition of the commitment needed for the plans to work.

Fourth, despite inadequate training preparations in some of the mines, there does seem to have been a culture change in most as measured by changes in the management styles being used. For example, in mines 1, 2, 5, and 7 both the employee and management respondents indicate an increase in participative management, as indicated by improved communication
between employees and management, better labour relations, more participation in decisions, and increased information sharing. It is worth noting, however, that these mines have invested time and money in creating this culture change, as they have either ensured adequate training for participants or involved all participants in the plan design. The culture change has not simply appeared after the implementation of the plan. Training and preparation are key to creating these changes.

Fifth, all of the plans studied cover everyone at the mine with the exception of some top management personnel, and all of the mines base the bonus payments on mine-wide performance measures. This helps to reinforce the team concept in the mines.

Sixth, it seems that the employees in these mines do value the opportunity to contribute their ideas to the operations, as the number of suggestions provided by them increased in most of the mines surveyed. Appendix 2 indicates that all that may be needed to prompt employees to communicate their ideas is a receptive management style.

Of the three underground mines in this survey, only one (mine 3) used another incentive system (piece-rate) in addition to gainsharing. Combinations of incentives must be carefully constructed to be effective. For example, it is possible that the individual incentive provided by the piece-rate plan in mine 3 will minimize the gainsharing plan's ability to encourage the pursuit of a common goal. However, in general, the objectives of the gainsharing plans in both the underground and open pit mines studied seem to be to emphasize the pursuit of a common goal and tap the human resource, and so far the plans appear to be equally applicable in both types of mines. Consequently, the potential applications in operating mines in Canada is wide in scope.
5.4.2 Other Observations

Contrary to some previous research in gainsharing, the mines studied seem to indicate that the number of employees covered by the gainsharing plan does not have a significant impact on plan success, and this helps to confirm Graham-Moore's opinion (1990a). For example, mine #5 employs 4400 people and yet seems to have been as successful with its plan so far as other mines which employ a fraction as many people. Furthermore, the existence of a positive employee/management relationship prior to gainsharing implementation does not seem too important, as several of the mines studied, for example 1, 2, and 7, appear to have successful plans despite poor initial labour relations.

However, this survey and the case study (Appendix 2) reinforce the hypothesis that the commitment of all management personnel is important to plan success. Moreover, there can be little doubt as to the importance of a mine leader who is committed to plan success and prepared to persevere. It is likely that this commitment is especially important in those situations where the initial labour relationship is poor. Often, a strong commitment to change will arise when the alternative is mine closure, and this may explain some of the success of some of the plans (for example 3 and 7). Mine #4 helps to underline the importance of an accurate database of production information prior to plan implementation. In this case, despite a management respondent who seems well versed in the requirements of gainsharing and strongly committed to its success, there seems to be a high degree of employee suspicion of the plan, largely due to a perception that management manipulates the bonus payments. It is possible that because the plan was implemented when the mine was opened, there was not sufficient data to construct a bonus line and as a result management is unsure of appropriate work standards.

Given the success of the mines with gainsharing plans, the assertion by some (Georgetti, 1993) that unions are prerequisites to true participative environments in mines
seems groundless. The one mine that is unionized (mine 7) has a successful gainsharing plan, but it has not had the full support of the union throughout the plan life, even though the employees seem to favour it (Appendix 2). This indicates that union support is not essential to plan success. However, employee support is essential, and in cases where there is employee support for a gainsharing plan but no union support, management must recognize that the employees' attitudes should drive the policies of the unions, not vice versa. Management should be secure in the knowledge that if they choose to implement a plan, it will be the support of the employees, and not the union, that will drive its success.

5.5 COMMENTS ABOUT THE SURVEY

While this survey is interesting and helps to reveal trends in gainsharing design in the mining industry, at this point there are some limitations associated with it which should be considered when reviewing its results. The first limitation has already been discussed, and involves the "snapshot" nature of the study. Because we have information on plan performance from only one point in time, our ability to link individual plan structure and management practices with long term plan success is limited to subjective evaluation based on experience with gainsharing in other industries. As yet there is little quantitative data to support suppositions about the ability of each plan to foster continuous improvement.

The second consideration is related to the surveys received from each mine. One employee and management respondent cannot accurately reflect the opinions of all employee and management personnel at these mines. For example, it is entirely possible that the subjective components of these results (questions which require the respondent to express his or her opinion) could be skewed by the individuals mood when answering the questions. Increasing the number of respondents from each mine would have minimized this problem, as
would have interviews with personnel on site where several people could have been involved and follow-up questions could have been pursued. However, budget limitations precluded these options. The single survey responses do provide some indication, however inexact, of the cultural issues associated with gainsharing plan success.

In developing the survey, the primary issues of concern included the information required from each mine, and the survey length and simplicity. There was a tradeoff between the information desired and the length of the survey, and in some cases the former was sacrificed to keep the survey length reasonable. It was feared that if the survey was too long and cumbersome, the responses would degenerate. However, although the survey is twelve pages, the adoption of the multiple choice format where possible helped to minimize response degradation.

Although participants in the survey were assured of their confidentiality, most mines were not too concerned about revealing information about their incentive plans. In fact, most participants were keen to provide information for the survey in order to build a database of the mines in Canada that use gainsharing and the plan structures that they are using.
CHAPTER 6 - CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSION

This research has reviewed the development of gainsharing plans from their origins in 1935 to their applications today. It has explored the motivational advantages that gainsharing has over some other incentives, discussed its compatibility with the dynamics of today's employees, and explained how it can be used to improve operational efficiency. After analysing the gainsharing concept and its possible applications in general, this research defined gainsharing in the mining context and explored the challenges and payoffs associated with implementing gainsharing in the mining environment. A telephone survey of operating mines in Canada has quantified the degree to which employee incentives are used in the mining industry and measured the popularity of piece-rate incentives, profit sharing incentives, and gainsharing plans in both underground and open pit mines. A survey developed and sent to the mines using gainsharing plans has gathered information on plan structures and results and helped to identify the benefits and challenges associated with implementing these plans in mines. Moreover, it has established a solid foundation from which to study these plans in the future.

In summary, gainsharing plans are employee incentives that combine a group-based financial incentive with a formalized communication network characterized by management practices that encourage, through actions, employee participation and communication in the workplace. Gainsharing plans increase the employees' stake in the business and give them a dual incentive to participate in its success. These incentives have been used successfully in a variety of different industries for many years now, and there has been considerable research done on their applications in these industries. Examination of the characteristics of the mining
industry and a review of the previous research indicates that gainsharing plans may be particularly useful in the mining environment, and the results of the survey of Canadian mines using gainsharing reveal that all of the plans are generating gains. However, gainsharing plans can require a large change in the management philosophy and always require a great deal of planning, commitment, perseverance, and some sacrifice in order to work properly. Some of the mines using gainsharing have not implemented the plans in the way dictated by experience with them in other industries, and time will determine whether or not these plan structures are successful. Nevertheless, the fact that mines are considering and in some cases implementing these plans demonstrates that the mining community is continuing to search for strategies that will generate competitive advantages into the future. This outlook has positive implications on the ability of the Canadian mining industry to compete in the years to come.

6.2 FINAL COMMENTS ON GAINSHARING PLANS IN MINING

The following section will summarize what this research has revealed about gainsharing plans in general and their applications in the mining industry in particular by providing recommendations and comments on the desired initial mine characteristics, plan implementation procedures, plan structures, and on-going plan management.

6.2.1 Initial Mine Characteristics

The mines studied seem to indicate that the number of employees covered by the plan does not have a large impact on plan success, and that the employee management relationship prior to plan implementation is not of great importance. What does appear important is a strong commitment from all management personnel to change their management styles, especially in those cases where there is little employee/management trust prior to gainsharing.
Furthermore, a plan champion, who is a high-level manager committed to change and prepared to persevere, will enhance chances of plan success.

Consistent operating conditions will have a positive impact on plan success, as the work standards will not require frequent changes and therefore the employee/management relationship will not be jeopardized. However, if operating conditions are inconsistent, a bonus line will minimize the need for management to alter the work standards, and therefore consistent operating conditions, although desirable, are not essential to plan success.

Accurate historic production information will help to ensure that the initial work standards are set realistically. Furthermore, in cases where bonuses are based on the cost of production and total production, the ability to link each period's production with its associated costs is important if the employees are going to appreciate the link between their work performance and the bonus payouts.

Finally, the mine should ensure that it has settled all personnel and technology developments prior to gainsharing implementation. All projected layoffs should be complete so that the mine can start fresh and build a new employee management relationship without having to endure the strain of layoffs. Furthermore, adopting new technology prior to gainsharing will help to avoid changes to the work standards and will encourage plan consistency. In many cases, plan consistency will be closely related to plan credibility. If possible, the new technology should be adopted far enough in advance of gainsharing to give some prior indication of the new expected production levels.

6.2.2 Plan Preparation and Implementation

This is likely the most important step in determining gainsharing success, as it is the point at which the objectives of the plan are developed and the personnel at the mine are prepared for the changes associated with the plans.
The first stage is a gainsharing seminar for senior mine personnel. This seminar will explain the concept and ensure that the gainsharing philosophy is consistent with the managers' vision, strategies, and products.

The second stage will determine the plan's scope and identify factors that should impact the plan structure. It is recommended that everyone with the possible exception of two or three top mine managers be covered by the plan. In large plants with several mines, it is advisable to adopt a plan in the mine in which it is most likely to be successful and then allow the concept to disseminate throughout the organization. If gainsharing is successful in the first mine, the culture change will evolve more smoothly and naturally throughout the plant if people recognize the advantages of the plans prior to implementation. Things that should frame the plan design include anticipated employment and technology, available production data, current management style, ore reserves, products, available resources, and employee and union perceptions.

The third stage will be the initiation of in-depth training for managers in the gainsharing philosophy. This training will proceed from this point up to the gainsharing announcement date and will be focused towards those managers who have the most direct contact with the employees. Training will continue after the gainsharing plan is announced as well.

The fourth stage is the employee survey. This will involve all employees and will be designed to reveal cultural concerns in the organization. Subsequent discussion of the survey and action on the employees' concerns will initiate communication and lend credibility to the plan.

The fifth stage will establish the broad strokes of the gainsharing plan by outlining the plan objectives and deciding on plan eligibility. The plan implementation schedule will be developed at this stage, based on information gathered in previous stages. It is in this stage that the support of all people involved with the plan should be secured. Either union people or employee representatives should be involved with the plan from the beginning to ensure that the
plan addresses their needs. Furthermore, involvement will give them a stake in the plan success.

Stage six will finalize the details of the bonus calculation and the communication network. Both of these elements are flexible, so the most important considerations during their design are the goals of the gainsharing plan. However, there are some general rules which will encourage plan success.

The bonus should be tied to factors over which employees have control and must be related to the mine's key success factors. Consistency in the bonus calculation is highly desirable, as it will increase plan credibility. Simplicity is also important if employees are to appreciate the performance/payout link, and with this in mind factors like absenteeism, safety, turnover, reserve pools, and bonus caps need not be included in the formula. The bonus should be mine-wide to increase the sense of teamwork and reinforce the fact that there is a common objective. However, the performance of each sub-unit must be tracked and compared with historic performance so that everyone is aware of their personal contribution to the mine's operations. This will also help management to identify weak links in the value-added chain. As stated, monthly payouts will enhance the link between work performance and rewards, but this must be balanced with the increased administration costs.

If conditions require, profitability may be used as a trigger for gainsharing payout. Rewards will still depend on work parameters controllable by employees, but will only be given when profitability reaches a certain level. This condition would be warranted, for example, if a company's shareholders would look unfavourably on bonus payouts when the company is losing money due to a slump in commodity prices. This is not a recommended procedure in most other cases, as it clouds the link between work performance and rewards, and can only decrease the motivational capacity of the gainsharing plan. If required, it is essential that when employee performance is good but profits are low, the rewards that were due to employees be carried forward to a point where profits are acceptable, and paid out at that time.
The communication network should be designed so that everyone is encouraged to volunteer productivity improvement ideas. As stated, its effectiveness will be determined primarily by the management style associated with it. A positive management style that demonstrates that the company values employees' opinions is essential, and even simple things like scheduling productivity improvement meetings on company time and responding promptly to employee suggestions will help to demonstrate that importance.

The seventh stage will introduce all employees and management to the particulars of the gainsharing plan. It is essential that everyone understands the objectives of the plan and the obligations associated with it. Employees should be taught basic business and operational concepts so that they understand the bonus calculation, how their performance affects the calculation, how their ideas can make them money, and how improved operations between departments can increase mine efficiency.

The eighth stage will be the announcement of the gainsharing plan. Productivity and cost measurements will begin at this stage. Ideally, the announcement will occur prior to a cyclical up-swing in business so that the plan achieves immediate credibility.

6.2.3 On-Going Plan Management

Plan management will include plan evaluation and modification. The plan should initially be monitored every three to six months to ensure it is achieving the objectives stated in the plan outline. A gainsharing board consisting of employee, management, and union representatives, if applicable, will be most effective in this task as it will have access to the concerns and priorities of all the involved parties. This board will measure the accuracy of the work standards, the commitment to change exhibited by management, the employee enthusiasm for the plan, and the operational changes attributable to the plan, among other things. The board will have the authority to modify the plan structure if it perceives problems.
This board will exist throughout the life of the gainsharing plan to ensure that the plan's structure evolves with the objectives and environment of the mine. Furthermore, it will spearhead programs designed to alleviate problems, like idea stagnation, that occur as the plans age in the mining environment. Such programs may vary from monthly production targets to the rotation of employees between the productivity improvement meetings of different mine departments.

Finally, if the plan is paying dividends, perseverance is essential if it is going to survive changing conditions. It is at this point that the commitment of senior mine personnel is very important.

6.3 RECOMMENDATIONS FOR FURTHER STUDY

Further study of this subject should focus on finding which plan designs and supporting structures are most conducive to long term plan success, where plan success is measured by its ability to enhance the mine's operating efficiency. This can best be achieved by having the participating mines complete a survey that measures plan performance, employee attitudes, and management styles on a yearly basis. Longitudinal data will provide more accurate information by minimizing the effects that factors like plan life cycle can have on results, and providing an indication of which plan characteristics, such as the management structures, bonus calculations, share ratios, bonus caps, and reserve pools, lead to long term success. If possible, future studies should also get a better measurement of employee and management attitudes in the individual mines surveyed by increasing the number of respondents from each mine.
BIBLIOGRAPHY
BIBLIOGRAPHY


Ames, L. (1992). Personal communication with Lorne Ames, Vice President of Human Resources, INCO Ltd.


Northern Miner, February 12, 1990.


APPENDIX 1

SURVEY OF GAINSHARING IN THE MINING INDUSTRY
The Applications of Gainsharing Incentives in the Mining Industry - Appendix 1

SURVEY OF GAINSHARING IN THE MINING INDUSTRY

Appropriate respondent

Whoever has been involved in the development, implementation, and monitoring of the gainsharing plan is probably the best person to respond to this questionnaire. If you do not think you are the best person to complete the questionnaire, we would appreciate it if you could refer it to the most appropriate person.

Purpose of this survey

This survey will examine the applications of gainsharing in the Canadian mining industry, measure the effects that it has on mining operations, and study steps that can be taken to help it work in the long run.

Confidentiality

Mine names will not be revealed unless their data is combined with data from at least three other mines. This policy is flexible, and if more confidentiality is required by any participant it will be arranged. In this case, all participants will be notified of the change, and given the option of having their data treated with the same degree of confidentiality.

Instructions

Please read the questions carefully. Most questions can be answered by circling the number in the appropriate box, or by providing a short description. Where appropriate, more than one answer may be circled.

Definition of Terms

- **Work Standards**: These are the standards that must be surpassed before a gainsharing bonus is paid. They can be related to anything from production measures to safety measures. If actual production in a certain period is less than the standard, no bonus is paid.

- **Time Studies**: These are studies that measure the amount of time that a task should take, based on engineering data.

Upon completion

Once you have completed the questionnaire, please return it using the enclosed pre-addressed, stamped envelope.

Questions

If you have any questions, please leave a message for Douglas McDonald at (604) 822-2540. I will return your call promptly.

Thank you for participating!
The Applications of Gainsharing Incentives in the Mining Industry - Appendix 1

I) BACKGROUND

1) How long has this mine been operating?

<table>
<thead>
<tr>
<th>1) LESS THAN 1 YEAR</th>
<th>4) 5 TO 10 YEARS</th>
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</thead>
<tbody>
<tr>
<td>2) 1 TO 3 YEARS</td>
<td>5) MORE THAN 10 YEARS</td>
</tr>
<tr>
<td>3) 3 TO 5 YEARS</td>
<td>6) UNKNOWN</td>
</tr>
</tbody>
</table>

2) How long ago was gainsharing implemented?

<table>
<thead>
<tr>
<th>1) LESS THAN 1 YEAR</th>
<th>4) 5 TO 10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) 1 TO 3 YEARS</td>
<td>5) MORE THAN 10 YEARS</td>
</tr>
<tr>
<td>3) 3 TO 5 YEARS</td>
<td>6) UNKNOWN</td>
</tr>
</tbody>
</table>

3) How would you describe the incentive scheme for operations personnel prior to gainsharing?

<table>
<thead>
<tr>
<th>1) INDIVIDUAL PRODUCTION INCENTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) PROFIT SHARING</td>
</tr>
<tr>
<td>3) NOTHING</td>
</tr>
<tr>
<td>4) OTHER (please specify)</td>
</tr>
</tbody>
</table>

4) Is another incentive system used in conjunction with gainsharing?

| YES | NO (skip to question 6) |

5) What is this system?

6) Is this a fly in / fly out operation?

| YES | NO (skip to question 8) |

7) What is the typical rotation?

| DAYS IN / DAYS OUT. |

8) Number of employees (if fly in / fly out operation, number of employees per rotation)

9) Is this operation unionized?

| YES | NO |

10) Has the extraction rate of ore at this mine been relatively consistent in the past?

| YES (skip to question 12) | NO |

Page 179
11) What factors have had a significant effect on the extraction rate? (more than one answer may be circled)

<table>
<thead>
<tr>
<th>1) CAPITAL INVESTMENTS</th>
<th>2) EQUIPMENT DOWNTIME</th>
<th>3) EMPLOYEE DISRUPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4) CHANGES IN ORE COMPOSITION</td>
<td>5) CHANGES IN MINING METHOD</td>
<td></td>
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<tr>
<td>6) OTHER (please specify)</td>
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</tbody>
</table>

II) PLAN DEVELOPMENT

12) Who originally thought of introducing gainsharing to your mine? (more than one answer may be circled)

<table>
<thead>
<tr>
<th>1) MANAGEMENT</th>
<th>2) UNION REPRESENTATIVES</th>
<th>3) EMPLOYEES</th>
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</thead>
<tbody>
<tr>
<td>4) OTHER (please specify)</td>
<td></td>
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</tr>
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</table>

13) Was information provided to upper mine management prior to plan development to explain gainsharing?

| YES | NO |

14) Who had input into the development of the gainsharing plan at your site? (more than one answer may be circled)

<table>
<thead>
<tr>
<th>1) COMPANY MANAGEMENT</th>
<th>2) EMPLOYEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) UNION REPRESENTATIVES</td>
<td>4) OUTSIDE CONSULTING GROUP</td>
</tr>
<tr>
<td>6) OTHER (please specify)</td>
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</tbody>
</table>
15) Which of the following considerations had to be taken into account when developing the plan structure? (more than one answer may be circled)

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<tbody>
<tr>
<td>1)</td>
<td>ORE VARIABILITY OR OTHER UNCONTROLABLE PRODUCTION VARIABLES</td>
<td>3)</td>
</tr>
<tr>
<td>2)</td>
<td>NUMBER OF EMPLOYEES IN MINE</td>
<td>4)</td>
</tr>
<tr>
<td>7)</td>
<td>OTHER (please specify)</td>
<td></td>
</tr>
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</table>

### III) PLAN STRUCTURE

16) What are the objectives of the gainsharing plan?  

17) How is the bonus calculated?  

18) What is the company/employee share of gains, respectively?

<table>
<thead>
<tr>
<th></th>
<th>0/100 %</th>
<th>50/50 %</th>
<th>100/0 %</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>25/75 %</td>
<td>75/25%</td>
<td>OTHER (please specify)</td>
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</table>

19) How often is the bonus calculated?

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<tr>
<th></th>
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<tbody>
<tr>
<td>1)</td>
<td>WEEKLY</td>
<td>3)</td>
</tr>
<tr>
<td>2)</td>
<td>QUARTERLY</td>
<td>4)</td>
</tr>
<tr>
<td>5)</td>
<td>OTHER (please specify)</td>
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</tbody>
</table>

20) Is there a cap on the gainsharing bonus?

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<tbody>
<tr>
<td>YES</td>
<td>NO (skip to question 23)</td>
</tr>
</tbody>
</table>
21) At what point is the bonus capped?

22) Is the excess bonus retained by the company, or distributed at a later date?

| 1) RETAINED | 2) DISTRIBUTED | 3) OTHER (please specify) |

23) Are all mine personnel covered by the plan?

| YES (skip to question 25) | NO |

24) Who is not covered by the plan?

25) Are meetings held between management and the employees covered by gainsharing?

| YES | NO (skip to question 36) |

26) Are the meetings mine-wide, or set up so that people in the same production centers meet with management? (more than one answer may be circled)

| 1) MINE-WIDE | 2) PRODUCTION CENTRES | 3) OTHER (please specify) |

27) How often are the meetings held?

28) How long are these meetings, usually?

29) Are the meetings held on company time?

| YES | NO |

30) How many management personnel usually attend these meetings?

31) What is their position in the mine?

32) How many employees usually attend these meetings?
33) How would you rate employee interest in the meetings?

| 1) VERY HIGH | 3) MODERATELY HIGH | 5) LOW |
| 2) HIGH      | 4) MODERATELY LOW  | 6) VERY LOW |

34) Are employees elected to attend, or can any employee attend? (more than one answer may be circled)

| 1) ELECTED EMPLOYEES | 2) ANY EMPLOYEES |
| 3) OTHER (please specify) |

35) What issues are discussed in these meetings? (more than one answer may be circled)

| 1) BONUS CALCULATION | 2) GRIEVANCES | 3) EMPLOYEE SUGGESTIONS |
| 4) MANAGEMENT DECISIONS | 5) FUTURE CHALLENGES |
| 6) OTHER (please specify) |

IV) COMPANY PRIOR TO GAINSHARING

36) Were employee opinions of gainsharing solicited prior to implementation?

   YES | NO (skip to question 40)

37) How were these opinions collected?

| 1) ALL-EMPLOYEE SURVEY | 3) ALL-EMPLOYEE VOTE |
| 2) MEETINGS WITH ALL EMPLOYEES | 4) MEETINGS WITH CREW CHIEFS |
| 5) OTHER (please specify) |

38) How many employees supported gainsharing prior to implementation? 

39) How many employees opposed it? 


Page 183
40) Prior to the gainsharing implementation, labour relations were very good.

41) Employee participation and interest in management decisions prior to gainsharing implementation was very high.

42) Prior to gainsharing, mine development was proceeding as projected.

43) There was considerable trust between employees and management prior to gainsharing.

<table>
<thead>
<tr>
<th>1 = Strongly Agree</th>
<th>5 = Strongly Disagree</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<td>3</td>
<td>4</td>
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<tr>
<td>5</td>
<td></td>
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V) PLAN IMPLEMENTATION AND SUPPORT

44) What type of training, if any, was provided for management when implementing gainsharing?

45) What type of training, if any, was provided for employees when implementing gainsharing?

46) Has a change in management style been required by gainsharing?

   YES                   NO (skip to question 50)

47) What is the nature of this change?

48) Is there any on-going training in the management styles associated with gainsharing?

   YES                   NO (skip to question 50)

49) If so, how often does it occur?

   1) MONTHLY
   2) QUARTERLY
   3) SEMI-ANNUALLY
   4) ANNUALLY
   5) EVERY TWO YEARS
   6) LESS THAN EVERY TWO YEARS
50) Are new personnel trained in the requirements or expectations of gainsharing?

| YES | NO |

51) Is there a formalized, periodic evaluation of gainsharing?

| YES | NO (skip to question 54) |

52) What form does this evaluation take? (more than one answer may be circled)

| 1) MEETINGS WITH EMPLOYEES | 2) INTERNAL AUDIT BY MANAGEMENT |
| 3) OTHER (please specify) |

53) How often is it used?

| 1) ONCE PER WEEK | 3) SEMI-ANNUALLY | 5) WHENEVER ISSUES ARISE |
| 2) ONCE PER MONTH | 4) ANNUALLY | 6) OTHER (please specify) |

54) This plan has received a lot of support from top mine management and head office.

| 1 = Strongly Agree | 5 = Strongly Disagree |
| 1 | 2 | 3 | 4 | 5 |

55) This plan has received a lot of support from crew chiefs and department heads.

| 1 | 2 | 3 | 4 | 5 |

VI) GAINSHARING MANAGEMENT

For the next two questions, more than one answer may be circled.

56) Who sets the work standards? (Work standards are defined on the cover page)

| 1) MANAGEMENT | 2) EMPLOYEES |
| 3) UNION REPRESENTATIVES |
| 5) OTHER (please specify) |

57) Are these standards mine-wide, or do they vary from stope to stope?

| 1) MINE-WIDE | 2) VARIABLE |
| 3) OTHER (please specify) |
58) How are they determined? ("Time studies" is defined on the cover page)

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<tbody>
<tr>
<td>1) TIME STUDIES</td>
<td>2) HISTORIC DATA</td>
</tr>
<tr>
<td>3) OTHER (please specify)</td>
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59) How often have these standards changed?

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</thead>
<tbody>
<tr>
<td>1) MORE THAN ONCE PER YEAR</td>
<td>5) ONCE EVERY FOUR YEARS</td>
</tr>
<tr>
<td>2) ONCE A YEAR</td>
<td>6) ONCE EVERY FIVE YEARS</td>
</tr>
<tr>
<td>3) ONCE EVERY TWO YEARS</td>
<td>7) LESS THAN ONCE EVERY FIVE YEARS</td>
</tr>
<tr>
<td>4) ONCE EVERY THREE YEARS</td>
<td>8) NEVER (skip to question 61)</td>
</tr>
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</table>

60) Why do they change? (more than one answer may be circled)

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<tbody>
<tr>
<td>1) CAPITAL INVESTMENTS</td>
<td>2) MAKE BONUS SIZE REASONABLE</td>
</tr>
<tr>
<td>3) CHANGES IN ORE COMPOSITION, MINING METHOD, OR OTHER FACTORS BEYOND MINER'S CONTROL</td>
<td></td>
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<tr>
<td>4) OTHER (please specify)</td>
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61) What information is shared with employees regarding the bonus calculations?


62) Is employee participation sought in some management decisions?

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<tr>
<td>NEVER (skip to question 68)</td>
<td>ALWAYS</td>
<td>SOMETIMES</td>
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63) What types of decisions?


64) What information is provided to employees to augment this participation?


65) How is this information provided to the employees? (more than one answer may be circled)

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<tbody>
<tr>
<td>1) WORD OF MOUTH</td>
<td>2) BULLETIN BOARDS</td>
</tr>
<tr>
<td>3) DEPARTMENT MEETINGS</td>
<td>4) CREW MEETINGS</td>
</tr>
<tr>
<td>5) OTHER (please specify)</td>
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</table>

66) Are operating decisions contrary to employee opinions ever made?

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</thead>
<tbody>
<tr>
<td>NEVER</td>
<td>SOMETIMES</td>
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</table>

67) Is it standard policy to provide feedback to employee participation?

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<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

VII) GAINSHARING RESULTS

68) What is the most common measure of productivity at your mine?

69) Please indicate quantitatively positive or negative changes you have measured in any of the following parameters, since gainsharing was implemented:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>% INCREASE</th>
<th>% DECREASE</th>
<th>NO CHANGE</th>
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<tr>
<td>Productivity</td>
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<tr>
<td>Maintenance costs</td>
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<tr>
<td>Machinery downtime</td>
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<td>Lost days due to injury</td>
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<td>Absenteeism</td>
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<td>Grievances</td>
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<td>Dilution</td>
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<td>Recovery</td>
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<tr>
<td>Other (please specify)</td>
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</table>
70) Have other developments, besides gainsharing, possibly had an effect on this data?

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<tr>
<th>YES</th>
<th>NO (skip to question 72)</th>
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</table>

71) Please indicate what they are, which factors they may have affected, and to what extent they may have affected them.

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72) Please indicate the gainsharing bonus paid per period since implementation. Please state the bonus in percentage terms, in absolute terms, or in comparative terms, giving the first payment a base of 1.00.

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On the scale below, please indicate the effect you believe gainsharing has had on the following factors:

1 = VERY POSITIVE  5 = VERY NEGATIVE

<table>
<thead>
<tr>
<th>Safety procedures.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<table>
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<tr>
<th>Communication between work crews.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</table>

<table>
<thead>
<tr>
<th>Communication between work crews and management.</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<thead>
<tr>
<th>Information sharing between employees and management</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<th>Employee participation in decision making.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<th>Labour relations.</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<th>Concern for cost control.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</table>
80) Have total labour costs changed with gainsharing implementation?

<table>
<thead>
<tr>
<th>1) NO CHANGE</th>
<th>3) DECREASED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) INCREASED</td>
<td>4) NOT APPLICABLE</td>
</tr>
</tbody>
</table>

81) If they have increased, has this increase been matched or exceeded by a corresponding increase in mine revenues?

YESES NO

82) Have manpower requirements changed since gainsharing implementation?

YES NO (skip to question 85)

83) If so, how? ________________________________

84) In your opinion, have these changes been brought on by gainsharing?

YES NO PARTLY

VIII) GLOBAL QUESTIONS

85) Overall, to what degree are you satisfied with the results of gainsharing, given the resources required to implement it?

1 = VERY SATISFIED 5 = VERY UNSATISFIED

| 1 | 2 | 3 | 4 | 5 |

86) Would you advise other mining companies to seriously consider installing a plan like yours?

YES NO

87) We welcome any final comments you would like to make regarding gainsharing plans in the mining industry.

__________________________________________________________________________
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(PTO)
APPENDIX 2
CASE STUDY OF THE
GLENROCK COAL COMPANY
BACKGROUND INFORMATION

The Glenrock Coal Mine, also known as the Dave Johnston mine, has been in existence since 1958. It is located approximately eleven miles from Glenrock, Wyoming and is now the oldest continuing coal mining operation in Wyoming, having produced more than 70 million tons of coal to date. It has supplied coal to the Dave Johnston Power Plant, which shares the same owners with the mine and is located sixteen miles to the south, ever since the power plant was opened in 1958. This power plant consumes all of the production of the Glenrock mine, and purchases it at the cost of production. The coal is transported from the mine site to the generating station via a private railroad operated by Glenrock Coal.

This is an open pit single dragline operation which recovers 2.8 million tons of coal annually from two coal seams at depths averaging 16 and 30 feet. The coal is loaded into 120 ton haul trucks using hydraulic shovels and backhoes, and is then taken to a crushing plant located at the rail loading site and stored in a 4,000 ton silo, where it is loaded into railcars and transported to the power plant.

MINE CONDITIONS UP TO 1988

Although the Glenrock mine had been operating successfully for 28 years prior to 1986, it became apparent that the operations would have to change for the mine to operate into the future. Increased competition from the low-cost massive reserves in the Powder River Basin combined with increasing costs at Glenrock were threatening the mine's market share. In response to these pressures, Glenrock had to lay off approximately 40% of it's work force and reduce production from 4 million tons per year to 2.8 million tons per year in 1986. Worker/management relationships declined as a result of the mass layoff and it appeared for a time that Glenrock was merely briefly delaying its closure. Gary Yoakam, the mine manager of Glenrock had heard of gainsharing incentive plans and had attended a seminar given by the
Bovino Consulting Group. The idea was fairly new to him, but he saw the possible benefits a plan of this type could have on a mine facing hard times, and was of the opinion that inaction would result in mine closure. After more research, it was concluded that implementation of this plan would be beneficial to a mine such as Glenrock, if undertaken properly.

THE GAINSHARING PLAN -- 1988

The gainsharing plan at Glenrock Coal includes everyone employed at the mine except the mine manager and his five direct reports. The plan is designed to improve productivity, provide a method of measuring productivity which is easy for everyone to understand, and financially reward eligible employees for attaining these new productivity levels. Through active participation between employees, first line supervisors and management, ideas are expressed freely and suggestions which may create improvements in productivity are generated. If productivity improvements are made, the employees then benefit in the form of Performance Plus pay.

The Performance Plus pay is calculated on a two month rolling weighted average, meaning that the bonus for a specific month is dependent upon the average cost per ton of coal delivered for the two months directly preceding it. A bonus is available whenever there are savings in the historic production cost of the coal. The bonus is dependent upon the tons of coal delivered as well as the measured mining cost per ton of coal. Management constructed a "bonus line" which reflects the average cost of producing coal at different production levels. The total gained is the total actual production multiplied by the historic per unit cost at that production rate minus the actual per unit cost. The employee's share of these gains is 25%. Table 1 illustrates this procedure.
If actual production = 200,000 tons at $5.90 per ton, then
Gain = 200K($6.00 - 5.90) = $20,000
Employee share = .25(20,000) = $5,000.

The employee's share of the gains is divided by the total payroll to give the "performance percent". This performance percent is then multiplied by each individual's eligible pay and the resultant amount, minus all the necessary tax deductions, is the performance pay that an individual is allowed to take home. Eligible pay is the average pay for all time actually worked in the current and previous month, excluding all non-working pay, such as sick pay, holiday pay, vacation pay, bonus pay, performance plus pay and any related type of income.

Once the bonus line was set by management, they constructed a performance chart that illustrates at a glance what the employee's bonus would be at different production and cost parameters. This chart (Table 2) helps to make the bonus understandable for everyone at the mine. On this chart, the cost per ton of coal delivered and tons of coal delivered are calculated on a two month rolling average. The factors considered when determining the measured mining cost per ton of coal include the cost of labour, materials and supplies, outside services deemed necessary, lease expenses, insurance costs, depreciation and amortization as well as various other costs.
Success of the gainsharing plan can also be attributed to a communication system and an idea evaluation network used to create a positive relationship between management and employees at Glenrock. The communication network at Glenrock consists of monthly 'Productivity Improvement' (PI) meetings at which employees can contribute ideas openly and freely. The PI meetings at Glenrock consist of everyone in a certain production centre, be it a drag-line crew or a maintenance crew, and either a supervisor or an hourly employee who acts as a facilitator by keeping people headed in the right direction. The facilitator is in charge of encouraging employees to volunteer problems and potential solutions as well as any possible safety hazards they are encountering in their work environment. These meetings begin by reviewing what has been accomplished since the last PI meetings and then go on to identify new priorities and generate new ideas. The meeting atmosphere and processes are guided by groundrules and an agenda which is adhered to by the facilitator. Tables 3 and 4 illustrate the meeting groundrules and agenda respectively.
Table 3
Productivity Improvement Meeting Groundrules

1. Don't ignore others contributions.
2. Clarification precedes evaluation.
3. Speak for yourself.
4. Separate idea from person.
5. All members participate.
7. Avoid decision by default.
9. View conflict as necessary and helpful.
10. Listen to and respect views of other members.
11. No such thing as a bad idea

Table 4
Productivity Improvement Meeting Agenda

1. Identify project/problems/ideas.
2. Select project/problems/ideas.
3. Cause and effect analysis.
4. Generate solutions.
5. Determine best solution.
6. Obtain approval or request.
7. Implement solutions and track results.
8. Follow up - assess goal attainment.

The link between these PI meetings is the Gainsharing Advisory Board (GAB). This board consists of 5 supervisors representing different production centres and 3 hourly
employees. The purpose of the GAB is to evaluate ideas from the PI meetings, provide feedback to the employees as to what is being done with their ideas and why, and to motivate the employees to increase productivity through advertising and promoting the gainsharing plan. The GAB is also responsible for watching over and making sure the bonus calculations are being calculated properly, in order to assure the rest of the employees that the company is working with the employee's best interests in mind.

In addition to the communication network, Glenrock also instituted a suggestion box so that people who had ideas at any time could contribute them and have these ideas evaluated by a Gainsharing Advisory Board.

**GAINSHARING IMPLEMENTATION**

This gainsharing plan was implemented in March of 1988. However, preparations for the plan had begun prior to the implementation and these preparations were instrumental in the eventual success of the plan.

1) **Employee Vote:**

First, the company was prevented from implementing the gainsharing plan without an employee vote. Although the union was skeptical of a plan that seemed to offer its members "something for nothing", the employees voted 60/40 for implementation of the plan. The main concern of the employees at the time was that productivity improvements would result in a loss of jobs. However, a guarantee from the mine manager that no one would be let go because of the gainsharing plan helped to alleviate these fears. This vote was very important, as it made the employees aware of the gainsharing plan and was the first step towards giving the employees a stake in its success.
2) Employee Survey:

An employee survey conducted by the Bovino Consulting Group was another important step in the plan implementation. This survey was designed to reveal the employee's opinions and criticisms of their work environment and initiate discussion on ways in which that environment could be improved. Given the recent layoffs, the employees had a lot to talk about. The survey was a cathartic experience for all mine personnel and helped to start the employee/management communication that is so vital to a gainsharing plan.

3) Training:

Training of management personnel began 15 months prior to the plan implementation. Managers spent one weekend out of every quarter with the Bovino Consulting Group learning facilitation and coaching methods and becoming familiar with ways in which they could improve communication and be more receptive to employee suggestions. The training sessions were geared towards the people who work "hands-on" with the employees, but were open to anybody who wanted to attend. However, employee participation was quite limited, perhaps because the training was held on the weekends and because of the poor labour/management relationship at the time. Management's initial use of their facilitation skills came when they discussed the results of the employee survey with the employees. Because everyone was interested in the survey and had something to say about it, communication was easy to initiate. Management focused on the "warm and fuzzy" issues at the beginning to remove barriers between employees and management and eliminate the "we/they" attitudes. By doing this, they gave the plan some immediate credibility in the eyes of the employees. Finally, despite the 15 months of training, the mine manager stated that if he could change one thing about the plan, it would be to spend more time training the supervisors.
THE MINE AFTER 5 YEARS -- 1993

Five years after the initial startup of the gainsharing plan at Glenrock, the cost to produce one ton of coal has decreased by about $4.00 per ton despite the decreased production and the effects of inflation. The number of employees at the mine has decreased through attrition from 185 after the layoff to 169 today, and one of the reasons for the decrease in the work force is that people realize that if they can pick up the slack left by a vacated position, the wages and benefits saved will have a positive impact on the cost per ton of coal. The monthly bonus payment has averaged 6.6% from the beginning of the plan to March 1993, and the cost of implementing the plan was recovered in the first year of its operation. Some of the success of the plan can be attributed to its accessibility to employees. A survey of 75 employees revealed that 56% of them feel their work performance can impact on the bonus paid. The results of this survey appear in Appendix 2a.

However, much of the success of the plan is driven by the communication network. Gary Yoakam stated that prior to the gainsharing plan the employees always had the desire to apply their productive ideas in the company, but were met with closed doors when they made their suggestions. Once the participative management style was adopted and the productivity meetings were initiated, the ideas started to flow. This formal communication structure, when combined with employee empowerment by the sharing of company information, resulted in two levels of communication and action. The first level is in the field at the time that it is needed, as the employees show initiative to respond to problems while on the job. The employees have the freedom to correct any flaws or improve any situations without having to go through a number of channels. With this increase in freedom, things are more likely to get done and more savings are likely to be realized. The second level is in the monthly meetings, where the formal structure allows the problem identification and idea evaluation necessary for the longer term challenges.
This two-leveled communication was made possible by management that evolved from supervising to coaching, and employees that believed that they could contribute to the mine's efficiency. In 1987, after the layoff, worker morale was low and cooperation with management was very limited. Employees constantly faced the possibility of not having a job the following day, due to the high costs and the increased competition within the coal industry. However, one of the unwritten conditions specified by the mine manager was that there would not be any layoffs because of this program. Fortunately, he has been able to stand by his promise and no employees have been relieved of their duties. This has improved worker morale, and in the process increased the feeling of trust between management and employees. Today, management and supervisors strongly feel that the employees attitudes have changed towards them since the implementation of gainsharing. They feel that the employees are less intimidated and can more easily approach them when they encounter a problem or have any recommendations about improvements in their work place. They feel that the we/they attitude has decreased drastically and that many employees now view them as a "coach" rather than a "boss". Furthermore, a survey of 75 employees at the mine revealed that 66% of them feel that they have something to contribute at the productivity improvement meetings, 63% discuss ways to improve operations more with their co-workers, 72% feel the productivity meetings are a good opportunity to suggest ways to improve mine performance, and 52% enjoy the opportunity to participate. Grievances between employees and supervisors fell from 35 per year to 15 per year, indicating a more co-operative relationship. Moreover, many employees have taken a very active part in the gainsharing program, such as making sure that any purchases that Glenrock makes are justifiable. This is in their best interest because the purchase costs are included in the bonus calculation which directly affects their financial reward. The willingness by management to release pertinent information to employees has strengthened the credibility of the program and has caused many managers to be more careful with their actions and decisions because they are now held accountable for them by the employees.
Teamwork between different departments and between employees in the same department has also been affected. Employees now see themselves working as part of a team rather than individually. Each department or shift views the next department or shift as a 'customer'. With this in mind, the objective is to supply the customer with what he wants or needs in order to satisfy him and improve operations. In this way, there is a greater appreciation of the value-added process in the mine, as the employee's knowledge of other department's requirements is increasing.

Finally, 36% of the surveyed employees felt that the gainsharing plan had improved the safety practices at the mine, and 5 of 14 management personnel agreed. The other 9 management personnel interviewed felt that the gainsharing plan had no effect on the safety practices.

The Glenrock Coal Company has not reached this point without encountering problems, however, and there will be more problems in the future. The next section will discuss the challenges they have faced and have yet to overcome for the gainsharing plan to continue to operate effectively.

**FUTURE CHALLENGES**

Training at the onset of the program was very extensive with intense weekend sessions for management and first-line supervisors every quarter for the first year. However, at the onset of the plan some of the supervisors were uncomfortable with the roll of facilitator. As a result, they were not obliged to lead the productivity improvement meetings, and employees who wanted to facilitate the meetings were given the appropriate training and put to work. In the last two years, only one refresher course in the management practices associated with gainsharing has taken place. The training sessions which have occurred have concentrated on methods used to maintain direction during productivity meetings. Furthermore, through feedback received from employees during the site visit and interviews, it was concluded that
there is no training for new employees and little or no re-training for long-term employees. The lack of training results in some confusion regarding positive management practices, plan objectives, and the bonus calculation, has led some employees to believe that the bonus is calculated inconsistently, and has some calling the bonus "bogus bucks". The insufficient training of management and employees can be demonstrated by the employee survey where 52% say that the productivity meetings are a waste of time because management never listens to their ideas anyway, 18% agree that the gainsharing reward accurately reflects their work performance, 27% feel that they are kept informed of important mine operating information, and 36% feel that when productivity is low they understand what they can do to improve it.

The communication process at Glenrock has not been without problems either. The gainsharing advisory board was established after plan implementation to encourage intradepartmental communication, renew interest in the plan, respond to all suggestions, and in general provide vitality to the plan. However, it is questionable whether or not this has occurred. The PI meeting at Glenrock which I was able to sit in on consisted of eight employees with one employee acting as a team leader and giving the meeting direction. The meeting was very positive, and the employees readily identified problems and generated possible solutions. However, when discussing the actions which had taken place since the last meeting, it was found that there had been little follow up on previous suggestions. It seems reasonable to assume that if suggestions are made as to what should be done to improve conditions and productivity at the mine, then someone should be in charge of following up on those suggestions. However, one member of the GAB stated that while the GAB is important, it is secondary to other work duties, and as a result it is hard to provide feedback to all of the suggestions. This lack of feedback may eventually destroy employee interest in the PI meetings.

The problem of "stale thinking" has also been encountered by those on the gainsharing advisory board and in the productivity improvement meetings. This stale thinking problem will eventually occur in most gainsharing plans which have been in existence for as long as the
program at Glenrock, especially when the company is producing the same product all of the time. This occurs because once all the major changes are implemented, it becomes more difficult for the same people to think of new ideas to promote gainsharing, and new ways to try and increase productivity. An apathetic attitude towards these meetings can possibly be eliminated by having these meetings quarterly, instead of monthly, thus allowing more time for the employees to fully recognize a problem and to attempt to determine and implement a solution. Furthermore, stale thinking can be decreased to some extent by the promotions of the GAB that are designed to renew interest. However, it remains a problem to be overcome.

Another problem encountered at Glenrock is the bonus calculations. The bonus line had not changed since plan implementation despite the effects of inflation over the five years. This is a major issue being addressed currently with this gainsharing program and a revised bonus line which includes the effects of inflation is being considered. As the employees see their bonus disappearing due to inflation, they will understandably begin to prefer a wage increase to bonus payouts, as wage increases are part of the collective bargaining agreement and therefore can be influenced, to some extent, by the union. Ignoring the effects of inflation will endanger the plan by slowly eroding the relationship between the employees and management.

At several points in the plan life, there were doubts as to the gainsharing plan's applicability and effectiveness in the mine. It was at these times that the perseverance of the mine manager kept the plan operating and helped it to become "institutionalized" throughout the mine. Four of the 14 managers interviewed stated that the key success factor for the gainsharing plan was the perseverance by the mine manager. This reinforces work by Goodman (1979), Schuster (1983), White (1979), Richardson (1985) and others that states that the commitment of a highly placed catalyst is very important to gainsharing success.

One of the variables during the plan implementation was the way in which the union would respond. The plan is separate from the bargaining contract and can be canceled at any time by the mine manager. Despite initial union skepticism towards the plan, most of the employees were in favour of it and it has succeeded largely because of the employees
acceptance, despite lacking the union's encouragement. This seems to indicate that it is employee acceptance, and not necessarily union approval, that is important in unionized mines for gainsharing to be effective. However, it is worth noting that the union was informed of the gainsharing plan at its initial stages and the objectives of the program were made clear. In order to show its dedication to the employees at Glenrock, management has not attempted to hide anything from the union and has maintained an open friendly attitude towards it. Furthermore, although it does not seem that consultation with the union is absolutely necessary in a gainsharing plan, union support can give the plan credibility and thereby increase the chances of its success.

Although union attitudes towards this gainsharing program have been fairly positive since its implementation, there have been disagreements between the union and the actions of the mine manager. One problem which can occur with the implementation of a gainsharing program at a union operated mine is that when undergoing contract negotiations, the gainsharing program may be used as a bargaining tool in order to justify not giving employees a raise. It is essential that this does not become the case at Glenrock, for this defeats the purpose of giving the employees a bonus for increased efforts to improve productivity. The gainsharing payment is designed to offer a financial bonus to employees over and above reasonable wages for above average performance. It is important that the gainsharing system not be viewed as a threat to the union, but rather it must continue to be an additional incentive system with the original objectives in mind.

SUGGESTIONS

In order to overcome the challenges facing the gainsharing plan at the Glenrock Coal Company, the following suggestions are made.
• More frequent training.

1) Management: Increased training of management personnel will ensure that the management practices essential to a healthy gainsharing plan continue into the future. The training will specifically target the feeling on behalf of the employees that the supervisors are not honestly interested in hearing their suggestions about work, and that management never listens to their ideas (questions 13 and 9, respectively, from the employee survey).

2) Employees. Training for employees will clarify the difference between production and productivity and ensure that they understand the mechanics of the bonus calculation. This will allow them to focus on important mine parameters and help them understand what they can do in times of low bonus payouts to improve the mine performance.

3) New Personnel. New personnel must be trained in the requirements and opportunities associated with the gainsharing plan so that it does not slowly erode as people retire.

• Suggestion follow up.

It is imperative that all suggestions provided by employees are reviewed and returned to the employees with explanations as to their feasibility. This demonstrates to employees that their suggestions are valued, and ensures that no valuable suggestions are overlooked. In order to achieve this, a full time gainsharing officer may need to be appointed, as there is a perception among current employees that the duties of the GAB are of secondary importance. The investment in the gainsharing officer may well turn out to be a very prudent one indeed.
Appendix 2
Case Study of the Glenrock Coal Company

- GAB and PI rotation.
  Rotating people among the gainsharing advisory board and the Productivity improvement meetings may renew people's interest in the meetings and prevent stale thinking from occurring. New people on the GAB will bring new ideas for plan promotions and will be able to address the challenges that they see confronting the mine from their perspective. Rotating employees between productivity improvement meetings may prove even more valuable. Because this plan has been in place for five years, the employees have become familiar with it and with their own production centres. As their knowledge of the company has grown, so has their sphere of influence. It may now be time to allow them to increase this sphere by joining other productivity meetings to discuss the interaction of the production centres and gain greater appreciation of all of the internal customers. This will present them with new problems and perspectives, and may revitalize the flow of ideas.

- Adjust Bonus Line.
  The longer that the company waits before adjusting the bonus line to reflect inflation the more they are jeopardizing the fragile relationship which has grown between employees and management over the past five years. As this relationship and the communication that springs from it is the backbone of the gainsharing plan, inaction on this point may be a fatal blow to the gainsharing plan.

CONCLUSION

The Glenrock Coal Mine in Casper, Wyoming, is a good example of a successful gainsharing program in a mining environment. This gainsharing plan has undoubtedly improved the operations of the company. In deed, the mine manager feels that the mine would now be
closed were it not for the plan. While other factors, most notably the use of a "dozer push" technology, have improved operations in the last 5 years, there is little doubt as to the importance of this plan in the mine's success. However, despite the effort and commitment given to this plan in the past, the challenges still faced by the mine are testament to the evolutionary process that must accompany every gainsharing plan if it is to be successful in the long term.
APPENDIX 2a

SUMMARY OF EMPLOYEE SURVEYS AT GLENROCK
EMPLOYEE SURVEY SUMMARY

The following is a summary of a survey intended to analyze the effectiveness of gainsharing at the Glenrock Coal Company. The responses of 75 employees at the mine are presented in percentage form.

POSITION IN COMPANY: ______________

1 = Strongly Agree
2 = Agree
3 = Disagree
4 = Strongly Disagree

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>1) I am aware of the gainsharing plan at this mine.</td>
<td>61.8</td>
<td>31.6</td>
<td>6.6</td>
<td>0</td>
</tr>
<tr>
<td>2) The productivity improvement meetings provide a good opportunity for me to suggest ways to improve mine performance.</td>
<td>10.5</td>
<td>61.8</td>
<td>14.5</td>
<td>13.2</td>
</tr>
<tr>
<td>3) The productivity meetings have improved my understanding of how my job fits into overall mine production.</td>
<td>3.9</td>
<td>40.8</td>
<td>42.1</td>
<td>13.2</td>
</tr>
<tr>
<td>4) I am kept informed of important mine operating information.</td>
<td>3.9</td>
<td>23.7</td>
<td>48.7</td>
<td>23.7</td>
</tr>
<tr>
<td>5) Most of the time, when mine productivity is low I understand what I can do to improve it.</td>
<td>2.6</td>
<td>34.2</td>
<td>47.3</td>
<td>15.8</td>
</tr>
<tr>
<td>6) I feel I have something to contribute at the productivity improvement meetings.</td>
<td>5.3</td>
<td>60.5</td>
<td>21.0</td>
<td>13.2</td>
</tr>
<tr>
<td>7) I believe that my work performance can impact on the bonus paid.</td>
<td>7.9</td>
<td>48.7</td>
<td>26.3</td>
<td>17.1</td>
</tr>
<tr>
<td>8) My job security has increased since gainsharing was implemented.</td>
<td>3.9</td>
<td>13.2</td>
<td>47.4</td>
<td>35.5</td>
</tr>
<tr>
<td>9) The productivity meetings are a waste of time because management never listens to my ideas anyway.</td>
<td>24.0</td>
<td>28.0</td>
<td>37.3</td>
<td>10.7</td>
</tr>
<tr>
<td>10) Since gainsharing was implemented, I discuss ways to improve work performance more with co-workers.</td>
<td>6.7</td>
<td>56.0</td>
<td>32.0</td>
<td>5.3</td>
</tr>
<tr>
<td>11) The gainsharing reward accurately reflects my work performance.</td>
<td>0.0</td>
<td>18.7</td>
<td>52.0</td>
<td>29.3</td>
</tr>
<tr>
<td>12) I enjoy the opportunity to participate at the productivity meetings.</td>
<td>2.6</td>
<td>50.0</td>
<td>34.2</td>
<td>13.2</td>
</tr>
<tr>
<td>13) I believe supervisors are honestly interested in hearing my suggestions about work.</td>
<td>5.3</td>
<td>32.9</td>
<td>34.2</td>
<td>27.6</td>
</tr>
<tr>
<td>14) I would prefer an individual bonus.</td>
<td>21.1</td>
<td>23.9</td>
<td>33.8</td>
<td>21.1</td>
</tr>
<tr>
<td>15) I would prefer a profit sharing bonus</td>
<td>35.6</td>
<td>30.1</td>
<td>23.3</td>
<td>11.0</td>
</tr>
<tr>
<td>16) The gainsharing plan has improved the safety practices at this mine.</td>
<td>6.6</td>
<td>30.3</td>
<td>42.1</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Note: All values are percentages