

GAINSHARING AS A COMPETITIVE TOOL

by

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Submitted to the
Alfred P. Sloan School of Management
in partial fulfillment of the requirements
for the Degree of

MASTER OF SCIENCE IN MANAGEMENT

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1992

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Abstract

Gainsharing has seen renewed interest by US corporations in the 1980s and 1990s as a means of obtaining a competitive advantage. Gainsharing involves sharing the rewards of productivity improvement through more effective use of labor, capital, and raw materials between the company and its employees. Thus the concept of linking pay to performance can be used as a business and/or survival strategy during times of decreasing productivity and increasing domestic and foreign competition.

This thesis provides an overview of gainsharing programs, and identifies the critical factors affecting their success or failure. This model is used in conjunction with a case study approach to analyze a company in the early stages of implementing a gainsharing program as a means to improve its competitive position. A hypothesis is made as to whether the gainsharing plan being implemented will be successful, and specific actions are recommended to improve the plan based on the experience of other companies. Information is presented from responses to interviews utilizing the components of the success/failure model. Interviews are conducted with personnel in line management, human resources, finance, and hourly workers.

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CHAPTER 1

GAINSHARING

A. Introduction

Gainsharing has gained national interest in the 1980s and 1990s because of declining levels of productivity [1]. Foreign competition and recent declines in productivity have increased organizational awareness in gainsharing. Many firms see it as a means to tie compensation to organizational performance, thus making compensation more flexible [2]. In 1961 the US General Accounting Office investigated 38 companies which had gainsharing plans, and concluded that they "warrant serious consideration by firms as a means of stimulating productivity performance, enhancing a firm's competitiveness advantage, increasing the monetary benefits of the firm, its employees, and reducing inflationary pressure" [3].

The literature on gainsharing is exhaustive in volume. Accordingly, this paper will not attempt to provide a detailed analysis and review of the subject. This chapter reviews the literature covering major variants of gainsharing plans, in order to present the background and some history of the field.

B. Description of Gainsharing

Gainsharing involves the sharing of rewards of productivity improvement through the more effective use of labor, capital, and raw materials [4] between the company and its employees. Rewards are paid at intervals -- monthly, quarterly, or annually -- usually in cash although there are other methods as well. It offers workers the motivation to

increase productivity [5]. Management is not obligated to make increased payments unless improvement occurs. In addition to increased pay potential, employees may also enjoy greater job security, increased recognition, and a fuller understanding of the company and its goals [6]. One key idea behind gainsharing is that it is a firm's human resources that are its greatest strength. Who better knows the job? How better can improvements be made than by employees' involvement? Gainsharing does not concern itself with productivity in the narrow sense, that is, so many units per hour, but in the broader sense of enhancing organizational efficiency [7].

Gainsharing plans vary from firm to firm. Some have major degrees of employee involvement, whereas others do not. Some have very broad profit-oriented measures while others are narrow. The trend is to customize the plan to meet the needs of the individual organization. Normally gainsharing plans are based on group bonus payment systems [8].

Daly [9] advocated that the selection and design of an incentive plan not be made on the basis of a personal preference of any particular manager or managerial group. He suggested that decisions be based on a diagnosis of workforce preferences and on a sound analysis of the organization's historical values and probable future directions.

The specific productivity target elements or areas vary from firm to firm. One firm decides what elements are to be monitored, and goals are developed usually based on historic performance levels. Any improvement made over the goal is then shared.

How the historical standard is established and the productivity improvements are shared denotes the variant of gainsharing. Some of the

more common variants are known as Improshare, Rucker, Scanlon, and Profit Sharing. McKersie [10] classifies Scanlon, Rucker, and Improshare as motivational plans: those that identify the participating group as a particular location. He classifies Profit Sharing as an organizational equity plan that rewards the organization for gains on a global basis. Each of these plans will be described later.

Once a gainsharing formula is determined, sensitivity analysis can then be used to determine results using historical data. Management can use this method also to evaluate what effects an improvement in productivity in the targeted areas will have on the firm. Such items as bonus payment, production levels, quality improvement, turnover, and absenteeism may be included in the analysis.

Initial interest in gainsharing often focuses on the formula and the bonus payment, since managers do not want to make payments without improvements that justify it. In most cases, once the exercise of researching, constructing, and testing formulas is completed, it becomes apparent that many types of formulas will work. This is one reason there are so many plan variations from company to company.

C. Requirements of Gainsharing Formulas

Whatever the particular gainsharing plan, virtually all plans require that a historical standard of labor costs be computed. Any increase in output combined with the same or lower actual labor cost creates a bonus. Most gainsharing plans split this bonus between the company and the total workforce [11].

The mechanics of establishing the historical standard are not necessarily simple. The method for constructing the bonus calculation denotes the variation of gainsharing -- be it Scanlon, Improshare, or a Rucker Plan. However, the keys to all successful gainsharing formulas are as follows [12]:

- (a) the normal, average, or standard labor cost is measurable;
- (b) the ratio of either sales value of production or units of production value to labor cost is relatively stable; and
- (c) the policy established for sharing true increases in labor productivity is fair.

Gainsharing formulas that meet the objectives quoted above showed produce motivating bonuses.

D. Types of Gainsharing Programs

Now we will review some of the major variants of gainsharing described earlier.

D.1. Scanlon Plan

Although profit-sharing has been around for over 100 years, the earliest experience in the literature with gainsharing appears to have involved the Nunn-Bush Shoe Co. in Milwaukee, in 1935 [13]. However, one of the best-known names in the field is Joseph Scanlon, a former accountant, union official, and later in his career a lecturer at the Massachusetts Institute of Technology. Scanlon played such an important role that the plan bearing his name, the Scanlon Plan, is often used generically to describe all gainsharing plans.

The original Scanlon Plan involved Scanlon's efforts to help save Empire Steel and Tin Plate Company. He had taken a leading role in the union organizing drive at the firm, and was elected President of the new local [14]. In 1938, the company was in financial trouble. Mr. Scanlon realized that something must be done. He persuaded the president of the company to join him in a visit to Clinton Golden, Vice President of the Steelworkers Union. Mr. Golden had long supported the notion of cooperation between management and labor, and advised them to work out a plan in which union and management could join together to save the firm. The result was a productivity plan which provided workers would get a bonus for tangible savings in labor cost. The driving force behind sharing the gains of productivity was to unleash the workers' intelligence [15]. The idea was based on Scanlon's belief that the average worker had an enormous reserve of untapped information on labor-saving methods. He believed this mechanism would allow workers to work smarter, not harder.

Scanlon's plan deals with economic productivity. The bonus is achieved when a given level of sales in dollars can be generated with less payroll cost than that of a historical norm covering typically three to five years [16]. The allowed labor cost is expressed as a percentage of sales. By keeping the formula simple, Scanlon was able to maintain the parties' attention on those variables within control of the firm and its human resources.

A typical Scanlon Plan bonus calculation is shown in Exhibit 1.1 [17]. Notice that the starting point is monthly sales in dollars. These are reduced for returns, allowances, and discounts, to arrive at net sales. Any increase in finished product inventory is added to net sales to arrive

at a value of production. Based on this level of production, an allowed payroll cost is determined (in this case, 20 percent of production value). Actual payroll cost is then subtracted from the allowed figure to arrive at a bonus pool. If the bonus pool is positive, the company retains a percentage (in this case 25 percent). If the number is negative, it all goes to a reserve fund which will be explained below. After the company's share is deducted from the bonus pool, a subtotal is arrived at. From the subtotal some percentage (in this case 25 percent) is retained in the reserve fund. The remaining 75 percent of the monthly bonus subtotal is then shared among the workers, with each receiving a percentage based on their wage percentage of the actual total monthly payroll costs.

The reserve fund is designed to protect the company during periods when actual payroll costs are above that allowable. Typically the reserve fund is settled on an annual basis. Should it be positive at year's end, it is split between employees and the company in some predetermined ratio (in this case 25 percent company, 75 percent employees). If the reserve fund is negative at year's end, it is typically absorbed by the firm. Whether it is positive or negative at year's end, it is always re-set to zero for the next Scanlon Plan year.

There are a number of variations of this formula. For example, the split ratio may differ. In most cases the split ranges from 20 to 100 percent between employees and the firm, with 50 percent being about average. Some companies may not take any percentage monthly, instead waiting until year's end when the reserve fund is divided. Others reason that some productivity improvements may be due to capital expenditures and

Exhibit 1.1

Typical Scanlon Plan Bonus Calculation
(Monthly)

1. Sales	\$1,100,000
2. Less Sales Returns, Allowances, Discounts	<u>25,000</u>
3. Net Sales	\$1,075,000
4. Add Increase in Inventory (At Cost or Selling Price)	<u>125,000</u>
5. Value of Production	\$1,200,000
6. Allowed Payroll Costs (20% of Value of Production)	240,000
7. Actual Payroll Cost	<u>210,000</u>
8. Bonus Pool	30,000
9. Company Share (25%)	<u>7,500</u>
	Subtotal 22,500
10. Reserve for Deficit Months (25%)	5,625
11. Employee Share (75%) (Immediate Distribution)	16,875
12. Participating Payroll Costs	168,750
13. Bonus Percentage \$16,875 / \$168,750	10%

Source: B.E. Moore & T.L. Ross, The Scanlon Way to Improve Productivity,
New York: Wiley-Interscience, 1978.

take a percentage each month to compensate for that. In this manner, it may be unnecessary to adjust the base ratios so often.

Although many firms still use this basic formula, there are some problems. One involves keeping the base ratio or allowed payroll cost up to date. The ratio can be affected by inflation, increased wages, or technology. When changes are necessary, workers sometimes fail to understand why, and distrust develops. Another problem is due to product mix. If a firm has a number of product lines that differ in the labor-to-sales ratio, varying combinations of product mix can throw off the allowed payroll costs. This is handled by the use of a split ratio formula whereby an allowed payroll percentage is developed for each product line, and then each period the allowed payroll cost is weight-averaged, dependent on the sales contribution of the various product lines.

A more sophisticated approach is the Multi-Cost Ratio, where other costs such as materials and supplies, or utilities, are included with payroll costs. This approaches profit-sharing, which will be discussed later in this chapter. The problem with these more complicated formulas is that they are often more difficult to understand, which can lead to employee distrust. Also, they include variables that individual workers may feel are out of their control, which can lead to disillusionment.

One of the unique aspects of the Scanlon Plan that may or may not be present under other plans is a participative structure to achieve labor/management cooperation. The participative philosophy seeks to improve relationships between management and employees. It seeks to build a cooperative team working toward mutual goals [18]. This involves information sharing of plans and progress, as well as economic education.

It also includes responsibility sharing which encompasses items such as delegation, decentralization, and employee involvement through teams or committees. The final criteria involves the actual gainsharing process [19].

Goodman, Wakely, & Ruh [20] state that if an organization is to achieve true efficiency, everyone in it will have to be actively involved. They note that the Scanlon Plan is based on this premise and has three independent concepts: a theory of employment; participation; and equity. McKersie [21] noted that the ideal incentive system should combine employees and employer interests in a system for participation, achievement, and reward (PAR). He reasoned that for effective participation, management must communicate its concerns so that employees will focus on problem areas. McKersie & Schultz [22], in their discussion of PAR, noted that it is based on the idea that people participate more energetically and creatively when they have a stake in the enterprise and when the enterprise is organized to encourage and facilitate participation in problem-solving.

In Scanlon, this involves a highly structured productivity suggestion system. The system processes suggestions through a committee structure. Suggestions often deal with how the corporation will operate and how jobs can better be performed or production made more efficient [23]. Normally, the committee structure consists of production committees and a screening committee to facilitate the suggestion-making and implementation process. Production committees are ordinarily organized around working units or departments, and consist typically of elected workers and a representative from management. Individuals can submit a suggestion or discuss their idea

with their production committee representatives who help evaluate the idea, express it clearly in written form, and either implement it immediately (if it is in the production committee's realm of responsibility and if costs are less than a given limit), or refer it to the screening committee.

The screening committee is composed of a production committee and management representatives. It meets typically once a month to evaluate costlier suggestions, review progress on implementation of suggestions which have already been approved, and to discuss company performance along with the bonus and the reasons for it, or lack thereof, as appropriate. Generally, the production committee representatives who attend these screening committee meetings then meet with their work group to review the discussions that were held.

D.2 Rucker Plan

The Rucker Plan, developed in the early 1930s by Allen Rucker, pays a bonus whenever a "value-added" gain is realized. Value-added is defined as sales minus raw materials and services procured outside the company. When value can be added with the same or less labor compared to a historical norm, there is a gain which can be shared. This could be considered a more refined formula for sharing than the Scanlon formula, and involves more cost than just labor. Also, unlike the Scanlon formula, it automatically adjusts to wage increases and inflation. However, like the Scanlon formula, it does not adjust for changes in technology nor in capital investment. Both plans are volume-sensitive and can be considered affected by product mix, meaning the size of the bonus can be affected by external

market conditions over which employees, and management for that matter, have little control.

Using case studies of data collected by the US Census and Survey's of Manufacturers, Allan Rucker [24] showed in the early thirties that economic productivity had been extremely stable from 1899 to 1929. A parallel analysis for the years 1964 to 1968 was conducted by P.J. Loftus [25], Director of the Statistical Office of the United Nations. The results were the same. While each industry has its own pattern, the study showed a stable relationship between production value and value added by labor.

Publishing in proprietary sources, Rucker performed industry-by-industry analysis of manufacturers. He maintained that in 90 percent of the cases, conditions were favorable to gainsharing. Unfortunately, few studies or evaluations of the Rucker Plan exist. The primary sources of information are proprietary booklets published by consultants. Despite the lack of data, it is known that the plan has been successful in a variety of manufacturing firms.

The concept of value-added is well known in accounting circles and has been the focus of attention for pay systems [26]. As with all gainsharing programs, the value-added formula can be tailored to include only workers with a very close connection to the production process or all personnel in an organization.

A typical Rucker Plan bonus calculation is shown in Exhibit 1.2 [27]. Step 1 reflects the difference between the selling price and price adjustments for seasonality. Step 2 reflects subtractions for outside purchases such as materials, supplies, and energy. Step 3 is the value added of \$340,000, or 84 percent of the selling price. Step 4 applies the

Exhibit 1.2

The Rucker Value-Added Formula
(monthly)

<u>Steps</u>	<u>Description</u>	<u>Value</u>
1.	Value of Production (Sales ± Various Adjustments)	\$1,000,000
2.	Less Outside Purchases (Mat'ls, Supplies, Energy)	
	Materials & Supplies	\$500,000
	Other Outside Purchases, Non-Labor Costs	<u>160,000</u>
		<u>660,000</u>
3.	Value Added (#1-#2)	340,000
4.	Allowed Employee Costs (Historical Analysis)	
	#3 x 41.2%	139,978
5.	Actual Labor (Employee Costs)	<u>129,978</u>
6.	Bonus Pool (#4-#5)	10,000
7.	Company Share (#6 x 50%)	<u>5,000</u>
8.	Employee Share (#6-#7)	5,000
9.	Reserve Fee Deficit Months (20% x #8)	<u>1,000</u>
10.	Bonus Pool (#8-#9)	<u>4,000</u>
11.	Participating Payroll	<u>\$80,000</u>
12.	Bonus Percentage	5%

Source: Graham-Moore, B. and T.L. Roso, Gainsharing: Plans for Improving Performance, Washington DC: BNA Books, 1990, p. 28.

historical average of labor value added to the product. This is called the Rucker Standard. In this example, 41.2 percent, or \$140,000, is the allowed (or expected) labor cost. Step 5 shows that the actual labor cost was \$130,000. Thus Step 6 reflects a bonus pool of \$10,000. A 50/50 split is a common policy, and Steps 7 and 8 reflect this. Steps 9 and 10 reflect a policy of a reserve for deficit months.

Because the participating payroll is \$80,000 (Step 11), the bonus percentage becomes 5 percent in Step 12.

Many similarities exist between the Rucker and Scanlon Plans, and these are both to some extent similar to Improshare (as we shall see). Like Scanlon, there is no one Rucker Plan. In principle the different gainsharing plan formulas vary in subtle but definitive ways. Subtle because the measurements all attempt to capture the ratio of labor input to production output. Definitive because the sensitivity of the measurements can be magnified by environmental and product mix factors in ways which could be a problem if left unchecked. Lastly, the differences in the formulas can result in behavioral differences which must be considered when choosing a formula. That is, no gainsharing plan will work without acceptance and some level of trust.

D.3 Improshare

Improshare, meaning improved productivity through sharing, is the creation of Michael Fein, an educator, consultant, and industrial engineer. Fein believed that the shortcomings of traditional management practices are due predominantly to the opposing goals of labor and management [28]. He feels that MBO, suggestion plans, conventional wage incentives, and most

wage increases -- while all are designed to motivate the worker to greater productivity -- do not reduce the problems of anti-productive peer pressure and lack of cooperation between individuals in small groups. The plan focuses on the number of work hours saved for a given number of units produced. The actual hours taken to produce a given number of units are subtracted from the hours expected to produce the same number of units. The savings that are realized by producing a given number of units in lesser hours, are shared between the firm and its workers. Payment is frequent, normally weekly.

There are three key factors to Improshare:

1. the work-hour standard;
2. the base productivity factor (BPF); and
3. the understanding by most workers of the relationship of hours worked to units produced.

By definition, a work-hour standard is the total production hours worked divided by the units produced. The acceptable standard could be set through the use of engineered standards (e.g. time studies) and/or through the use of previously generated accounting data. Either way -- or both -- the standard is the agreed or expected number of hours required to produce an accepted level of output.

D.3.1 Base Productivity Factor

The base productivity factor, or BPF, is the total production and nonproduction hours, divided by the value of work in work hours. For an example see Exhibit 1.3 [29]. The Improshare calculation (Exhibit 1.3)

shows how the US General Accounting Office publication presents principal ideas of this calculation:

1. work-hour standards are total production of hours of "good production";
2. work-hour standards are normally computed for each product line; and
3. the base productivity factor (BPF) is the ratio of actual human resource hours to standard hours.

Each product line's output, at its own standard, is multiplied by the BPF to compute the expected number of total hours required to produce that output. Then, actual hours are calculated and subtracted from the expected hours (sometimes called Improshare hours). The difference, positive in this example, is 600 hours. These hours can be converted at average wage rates to create a cash value.

D.3.2 Simplicity of Improshare Formula

Another key factor associated with Improshare is the simplicity of the formula and this its ready comprehension by the workforce. While Fein has stated that many elements of the Improshare formula have been in use for twenty years [30], his formula avoids some problems of Scanlon-type formulas. Improshare presents the concept of productivity to the worker in terms that are easily understood, hours worked to produce "X" amount of output.

There is some evidence to suggest that workers in firms using Scanlon Plans fail to understand the bonus formula. Many Scanlon firms spend a great deal of time educating the workforce about the formula -- often to little avail. Conversely, one study of an Improshare firm shows that line

supervisors can readily explain to their subordinates what factors influence the formula [31].

Improshare, through the BPF, pools all production and non-production hours from a selected base period and this is a composite measure of direct and indirect work. Because there are no standards on indirect work, a necessary assumption is that there is a constant relationship between direct and indirect work. The BPF, therefore, is constructed from data from an average period of productivity, or one that management recognizes as acceptable. This differs from a Scanlon Plan, which looks at the total budget period. The Improshare calculation is therefore constructed to "beat yesterday's performance," if yesterday was a representative day. Once the BPF is computed, it "represents the relationship in the base period between actual hours worked by all employees in the group and the value of the work (in work hours) produced by these employees" [32]. Aside from the product mix problems cited earlier, Fein has argued (in a manner similar to that of the value-added Rucker Plan) that volatility in the inputs and outputs of doing business, such as raw materials prices and fluctuating levels of sales, hurts the Scanlon gainsharing calculation. The Improshare calculations exclude these ingredients from the formula, using only hours required to produce.

D.3.3 Acceptance of Improshare

The adoption of Improshare programs has been extensive -- Firestone, Hooker Chemical Co., Rockwell International, Ingersoll-Rand, Pre Stalite, McGraw-Edison, and Stanley Home Products to name but a few -- have one or more Improshare installation [33]. One advantage of Improshare, in

Exhibit 1.3

The Improshare Calculation
Base Period

Facts: 40 direct and 20 indirect period

Work hour standard = $\frac{\text{Total Production Work Hours}}{\text{Units Produced}}$

Product A = $\frac{20 \text{ Employees} \times 40 \text{ Hours}}{1000 \text{ Pieces}}$ = .8 per piece or .8x1000 = 800

Product B = $\frac{20 \text{ Employees} \times 40 \text{ Hours}}{500 \text{ Pieces}}$ = 1.6 per piece or 1.6x500 = 800

Total Standard Value Hours = 1600 in Base Period.

Base Productivity Factor (BPF) = $\frac{\text{Total Production \& Nonproduction Hrs}}{\text{Total Standard Value Hours}}$

BPF = $\frac{(40 \text{ Direct} \times 40 \text{ Hrs}) + (20 \text{ Indirect} \times 40 \text{ Hrs})}{\text{Actual Hours}}$

BPF = $\frac{2400 \text{ Production Hours}}{1600 \text{ Standard Value Hrs}}$ = 1.5

Bonus Calculation for Month X

Product A = .8 Hrs x 600 Units x 1.5 BPF = 720

Product B = 1.6 Hrs x 900 Units x 1.5 BPF = 2160

Improshare Hours (Std. Hrs for Actual Units Produced) = 2880

Less Actual Hours = 2280

Gained Hours 600

Employee Share (50% of 600 = $\frac{300}{2280}$ = 13.1%)

addition to that of its simplicity, is the fact that no employee involvement is required to install it. While this is technically true, in practice Improshare may have almost the same advance build-up as a Scanlon Plan, including the installment of labor-management committees. Sometimes consultants are utilized to prepare management with a program and training so that employees have sufficient information about the plan. However, there is no particular structure to Improshare as there is with Scanlon. Fein, who favors a strong communications network, believes that labor-management committees under Scanlon plans are too structured [34].

In point of fact, Improshare can be installed in firms with either autocratic or participative management styles. Labor-management committees, suggestion systems, and other examples of employee involvement may or may not be a part of Improshare. In many ways, Improshare spans the gap between those firms with no interest in participative management and concepts such as the quality of work, and those firms that do espouse those management philosophies. Therefore, Improshare is, above all, a formula which can be applied to many situations. As a formula, however, Fein [35] argues that it is a "way of life" because management obligates itself to a set of rules, yet places no limitations on the workers. No memo of understanding, vote, or commitment is sought from employees in advance. The purpose of Improshare is to make workers bottom-line oriented.

E. Profit Sharing

Profit sharing overcomes some of the problems with the Scanlon and Rucker Plans because its formula is self-adjusting. It reflects current market conditions, and therefore it avoids difficulty with the base ratio

that might otherwise require periodic change. However, as with other gainsharing programs, profit sharing is also volume-sensitive, so windfalls can occur. Profit sharing ties directly to the firm's economic productivity as measured by the bottom line. It overcomes some of the weaknesses in the Scanlon approach because it focuses on all costs. It also encourages acceptance of change and new technology that might increase profits. It provides teamwork between employees, management, and stockholders by providing a single target upon which success or failure bears on all parties alike. There exists no double standard, meaning no bonus is paid when the firm is losing money. However, there are problems with profit sharing, in that results depend on factors that are beyond employee control. It can lead to employee difficulty in seeing the relationship between effort and reward, so in large organizations it may be difficult for employees to realize that they count and can make an impact.

Good communication and employee involvement can bridge this gap. These efforts must convince employees that their performance counts. One way to do this is to set interim goals, that is, specific targets that employees can aim for, such as scrap ratio, absentee and turnover rates, production, sales, payroll to sales, and profit objectives. These specific targets are sometimes combined with a profit-sharing plan. If this is done, management should publish and discuss on a regular basis (monthly or quarterly) performance relative to target goals. In this way employees know how they are doing.

F. Summary

In this chapter, gainsharing has been described; its history reviewed; and strengths and weaknesses of some major variants discussed. In addition, some of the relevant literature has been reviewed.

Gainsharing involves sharing with employees the rewards of productivity improvement. It is based on the idea that a firm's greatest asset is its employees. It is designed to unleash workers' knowledge and to thereby improve operations. Many firms see it as a way to improve competitiveness and to tie compensation to organizational performance. It also provides employees with greater security, increased recognition, and a better understanding of the firm and its goals.

Gainsharing plans vary significantly from firm to firm. Some have broad profit measures, others narrow. Some have a number of target areas, others few. Some plans have major employee involvement, others have little or none. The plans should be customized based on analysis of workforce preferences, the historical values of the firm, and a consideration of future directions.

Initially, firms place great emphasis on the actual formula, but it has been found that many formulas will work. Goals are normally based on historical performance. Sometimes annual reserve funds are established in order to protect the firm when performance is below par. In order to avoid worker disillusionment, it is important that goals be achievable and that workers feel they can control target areas.

We reviewed also participation processes, and noted how they help to improve relations and to build cooperation through teamwork. Teams often involve natural work units. Participation involves three elements:

information sharing, responsibility sharing, and sharing gains achieved. There is significant evidence that people participate more energetically when they have a stake in the enterprise through gainsharing.

Footnotes for Chapter 1

- [1] Ashburn, Anderson, "Devising Real Incentives for Productivity," American Management, Special Report 704, June 1978, pp. 115-130.
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CHAPTER 2

FACTORS AFFECTING SUCCESS OR FAILURE

A. Introduction

The only existing evaluation studies of the Scanlon Plan come from MIT, due to MIT's historical connection with its author, Joe Scanlon. Early studies are unfortunately predominantly anecdotal in nature. Until the late 1960s this less rigorous type of case study was the main method used in analyzing Scanlon and gainsharing. The following are organizational or environmental conditions associated with early Scanlon Plan research.

- Front-line supervisors may feel threatened by the suggestion system because they feel they are no longer the boss, or because a high rate of suggestion makes their past behavior appear autocratic [36].
- A fair measure of the performance of an organization may be impossible [37].
- Managerial attitudes must either favor participative management or be disposed to change [38].
- Previous wage structures such as individual incentive-suggestion systems must be phased out [39].
- The Plan can focus too intently on labor savings while not providing sufficient attention to other sources of savings [40].
- Such characteristics as size, culture or philosophy of management, technology, and sophistication of accounting system must be considered in choosing a gainsharing program that makes optimal use of these factors [41].

Now that Improshare is so popular, we may begin to see evaluation studies of its use. Three-hundred companies have experimented with or installed Improshare (Fein [42]). By analogy, favorable outcomes may be duplicated in evaluation studies of Improshare and other forms of gainsharing if they produce bonuses and emulate the philosophy of Scanlonism [43]. The literature of gainsharing has until recently focused on the Scanlon Plan. Key features of this plan are as follows:

- The plan enhances coordination, teamwork, and sharing of knowledge at lower levels [44].
- Social needs are recognized through participation and mutually-reinforcing group behavior [45].
- Attention is focused on savings -- not just on quantity [46].
- Acceptance of change due to technology, market, and new methods is greater, because higher efficiency leads to bonuses [47].
- Attitudes of workers change; they demand more efficient management and better planning [48].
- Workers try to reduce overtime -- to work smarter, not harder or faster [49].
- Workers produce ideas as well as effort [50].
- More flexible administration of union-management relationship occurs [51].

This chapter reviews the literature and summarizes what have been some of the key factors of success and failure of gainsharing programs. But before looking at critical success factors of gainsharing, a brief review of historical results is provided.

B. Results of Gainsharing

Fein [52], in an effort to determine what effect work measurement and wage incentives had on productivity and costs, sent 5800 questionnaires to members of the Work Measurement and Methods Engineering Division of AIEEE. From the 453 usable responses, he found that changing from no measurement to measured day work (MDW) produced an average productivity increase of 24.7%. He found also that in changing from no measurement to incentives produced an average productivity increase of 51.5%. A summary of data showed that incentives produced 42.9% more output than MDW, at 13.5% lower costs, while providing 23.5% higher employee earnings.

The president of Rocky Mountain Data Systems (30 employees), a specialty service company which provides diagnostic information to the dental profession, described the successes his company enjoyed under a Scanlon Plan [53]. He reported improved motivation and productivity of employees, an increase in profits, and a marked 70% lower employee turnover. Employee compensation increased 14% per year, compounded. He also described new horizons for employees at the maximum end of their fixed pay scale, as well as promotion of teamwork versus individual competition.

A US GAO study [54] of 38 firms with some form of gainsharing reported the following findings:

- Firms with annual sales of less than \$100M averaged 17% savings in workforce costs. Companies with sales over \$100M averaged 16% savings.
- 81% of firms reported improved labor relations.
- 47% reported fewer grievances.
- 36% reported a lowered rate of absenteeism.

- 36% reported reduced turnover.

Bullock & Lawler [55] presented information based on published and unpublished manuscripts, theses, and dissertations, that describes in detail 33 gainsharing plans. Among their findings are the following:

- 67% of firms reported that the plan was successful.
- 73% of firms reported some improvement in productivity quality, cost reduction, or service to customers.
- 76% reported an increase in suggestions and innovation.
- 64% reported improved individual attitudes, morale, or quality of worklife.
- 55% reported improved cooperation between supervisors and workers.
- 91% reported bonuses or pay increases due to improved performance.

Sherman [56] described an increase in productivity and direct labor efficiency following successful initiation of a Scanlon Plan in a Tennessee plant. Utilization of indirect labor increased substantially, as well. There was a noticeable drop in grievances, absenteeism, and turnover.

Moore [57], in a study of four DeSoto Corporation plants with Scanlon Plans, reports a number of intangible benefits cited by plant managers.

Included were:

- a feeling by employees of participating actively in the management of their group;
- a mechanism through which employees could contribute ideas;
- an increased number of suggestions from all levels of employees;
- employment development at all levels;
- identifying of employees with potential, for possible supervisory work;

- increased knowledge on the part of employees in operations and capital budget requests, not only in their own department but in others throughout the plant;
- a means of uniting two or more departments into a common project;
- an increased ability, because of the plan, to attract good employees, as compared with other plants in the area.

Use of the plan is not restricted to private industry. When the Reagan Administration sought means to decrease costs while increasing productivity, one method used was gainsharing [58]. The US GAO provided the following data on 21 Department of Defense gainsharing plans implemented during the past decade:

- cost savings of from \$23,000 to over \$1M;
- employee time lost at one facility was reduced by 80%;
- reject/rework rates dropped from 5.9% to 1.1% at one site;
- savings of \$186,000 over a two-year period was reported at an Army depot with 100 employees.

In addition to these general surveys, there are many analyses of individual cases. Gainsharing and profit-sharing plans were found to be basically successful in most cases discussed. The tone of the case studies is usually, but not always, favorable to gainsharing. In two cases of failure, Allean & Gray found that profit shares or bonuses were apparently too small [59]. The sharing of monetary gains, however, does not always get all the credit in successful cases. Several authors found worker participation to be an essential component of success, and may be more important than the monetary incentive alone.

In general, the mechanisms which translate group incentives into increased productivity are poorly understood. The literature emphasizes such factors as increased worker involvement, more labor/management cooperation, heightened monitoring of fellow workers, more information sharing, working smarter, greater awareness of and interest in the company's profitability, and improved corporate culture [60]. Most observers agree that group performance-related pay systems are more likely to lead to improved productivity than are plans not tied to appropriate performance measures. But it is also a common observation that background organization conditions can significantly influence the pay/performance link.

C. Critical Factors for Success and Failure

Practitioners tend to indicate that otherwise well-designed gainsharing plans can fail if, during the implementation phase, trust and cooperation are not generated [61]. Case studies usually conclude that gainsharing can help to improve productivity -- in an environment with the appropriate corporate culture.

The literature contains little detailed analysis of why gainsharing programs fail. However, failure of gainsharing is most often linked with the managerial expectation of increased performance, with little effort directed toward making it happen. Similarly, if employees expect significant bonuses without major behavioral changes to increase performance, they are likely to become discouraged if bonuses do not materialize. Expectations and changed behavior are key elements of success or failure.

Graham-Moore & Ross [62] provide the following summary of characteristics exhibited in high probability by firms whose gainsharing plans have failed.

Organizational Variables

1. low trust or confidence in management, low accountability, low levels of participation, and lack of direction;
2. poor communication among and within departments, and communication patterns that are primarily from the top down;
3. inability of people to relate to the system;
4. low control over revenue and unstable employment;
5. low levels of identity with the organization, its past, present, and future opportunities and problems;
6. inadequate wages when compared with other employees and area firms.

Social, Cultural, and Institutional Variables

1. poor industrial relations and confidence, and poor union relations;
2. low-level need for involvement and commitment.

Financial Information and Competition Variables

1. poor internal financial information system;
2. lack of knowledge of, or dedication to, beating the competition;
3. unstable conditions in output or input markets; declining markets;
4. severe competitive conditions and limited commitment to change;
5. severe governmental constraints.

The more these variables are present in a firm, the greater the risk of failure. But conversely, if one analyzes them carefully, one should not be surprised to find that they are the variables commonly cited as important to the success of any organization. That is, if the company is unsuccessful or lacks improvements, in all likelihood its gainsharing plan is doomed, unless drastic actions are taken. Thus to be successful as a gainsharing company, there must exist an organizational need to change or to excel. Without these attitudes, neither the employees nor management is likely to make the changes necessary on a continuing basis, and the system is likely to fail. The following sections of this chapter provide further evidence from the literature on the critical factors of success and failure in gainsharing.

C.1 Organizational Size

According to Moore [63], a factor common to the success of gainsharing is the number of employees within the firm (range from 80 to 6000). Moore claims that there is a ceiling involving organizational size, at which organization-wide incentives lose their impact. Campbell [64] concluded that larger groups have more difficulty distinguishing the relationship between their performance and the reward. On the other hand, LeSieur & Puckett [65] have taken issue with the idea that size affects success. White [66] conducted an interorganizational study that identifies some factors -- that had been identified in the literature -- that account for the variance relative to the success of Scanlon Plans. His findings revealed no relationship between success and company size. Instead, he found that success was positively related to the average level of

participation and decision-making reported by employees, the number of years the plan has been in use, managerial attitudes toward the plan, and expected level of success for the plan. Although there seems to be no consensus on firm size as a factor critical to the success of gainsharing, it is surprising to see the plan in use in larger organizations, i.e. those with greater than 5000 employees. The key factor seems to be that, at some point, organization-wide incentives lose their impact. The larger the group, the greater the difficulty workers encounter in seeing what effect a change in their performance can have on overall production or profitability.

C.2 Other Variables

More rigorous research has looked at variables other than size of organization. For example, technology, environment, and management style have been assessed for their impact as a critical factor of successful gainsharing [67]. Researchers Goodman and Moore have assessed these variables, structuring the process wherein all employees developed new beliefs concerning a Scanlon Plan. The chance that an employee would make a productivity suggestion was associated with group attitudes and supervisory acceptance. Group and supervisory approval seem to influence appropriate gainsharing beliefs.

C.3 Union-Management Cooperation

One institutional variable that has been examined empirically is union-management cooperation. Because the philosophy of gainsharing stresses increased cooperation, it is surprising that there has been little

research in this area. Schuster [68] assessed the impact of union/management cooperation in nine manufacturing firms over a five-year period. Six of the nine manufacturers had either Scanlon or Rucker plans. Time series analysis in unionized gainsharing companies showed that four firms experienced statistically significant positive change in productivity; two others reflected positive trends. Employment remained stable in eight of the nine organizations. Only one gainsharing firm fared poorly in the sample. While larger samples are always preferred, Schuster drew conclusions from the study, as follows.

Cooperation requires a stimulus to change a traditional bargaining relationship: in the present study, cooperation was stimulated by the dire financial position of one company and by the adverse competitive conditions in several others. Additional stimuli were provided by factors internal to the firm, including a desire to upgrade the workplace environment, improve communication, and replace or supplement an existing compensation program [69].

Graham-Moore & Rodgers surveyed gainsharing organizations to assess the relationship between institutional/organizational factors and type of gainsharing calculation. They found no difference in bonus history between union and nonunion organizations. Even though gainsharing began in the union environment, its greatest growth has been in nonunion firms.

As a result of the strong interest in worker participation strategies such as quality of worklife, quality circles, and employee involvement programs, Kochan, Katy, & Mower have characterized worker participation programs as a "mixed bag" full of risks for union members and union leaders. Stand-alone employee involvement programs seem to have a poor chance of becoming a permanent part of the organizational structure. Schuster's research offers support for the ability of gainsharing to

reinforce organizational cooperation with equitable bonuses. The research indicated that process is more important than institutions or structures. That is, the way in which gainsharing is introduced and whether it is perceived as an equitable program are greater determinants of long-range success than the existence of a union or non-union environment.

However, the union can play a major role in determining the degree of culture change within an organization. If there are high levels of labor-management conflict in the collective bargaining area, it would be expected that this would spill over to the productivity programs, and might then have negative impact on their viability. If the relationships at the plant or site level are cooperative, the productivity plans will most likely exhibit longer-term viability [70].

C.4 Stability of the Environment

Instituting a change program such as gainsharing in an organization is a difficult task, even in the best situations. In some situations the added instability of the environment often makes things worse. Graham-Moore & Ross [71] found two common types of environmental instability: major declines in the demand for an organization's products; which in turn lead to curtailments in the workforce. These effects changed the composition of many groups that were integral in instituting the productivity programs of companies they started. These groups become less effective, lowering the degree of institutionalization or culture change. Similar results were reported in another study [72], as an economic recession led to layoffs and bumping. Environmental factors such as these

represent a major obstacle to establishing effective change in the organization.

C.5 Participative Management

Participative management is crucial to traditional gainsharing success. The contribution of participative management is to clarify the connection between individual contributions and organizational performance -- not just to require more effort. Lawler [73] hypothesizes that participative management refers to those behaviors and actions which build trust during the process of improving organizational performance, a necessary precedent to the bonus. This idea is echoed in earlier studies which state the importance of the workforce's understanding how the gainsharing calculation works. Participative management shifts power, knowledge, and information down into the organization. If managers ask employees for intelligent input, they must exchange some power, knowledge, and information in order to get it.

C.6 Planning and Implementation

Carl Frost was an early implementor of the Scanlon Plan. Frost believes that a description of what the plan is not is fully as important as that of what the plan is [74]. He emphasizes that the plan is not a substitute for an incentive system, as an end to bitter and antagonistic industrial relations, or as a pat formula or set of procedures to be mechanically implemented for automatic operation. He outlines four critical principles that are inherent to the plan:

1. employee identification and willingness to accept ownership of organizational problems;
2. structured and guaranteed opportunity and responsibility for participation of all employees;
3. equitable return for all employees; and
4. managerial competence and leadership.

Frost states that the first step in exercising leadership is for the highest levels of management to identify the mandate of the organization, which consists of the following components:

- Managing the marketplace -- Who is the customer? Who is the competition? Why is the competition successful?
- Managing physical resources for the imperative return on investment.
- Managing with assured profitability.
- Managing human resources to afford them their best employment opportunity.
- Developing and managing the unique technology to survive and succeed.

Frost notes that after management identifies the mandate and prior to implementing a Scanlon Plan, three questions must be answered by all parties:

1. Do you understand the mandate?
2. Are you able and willing to accept ownership of the problem?
3. Are you able and willing to make a commitment to the achievement of the mandate?

A satisfactory percentage of positive answers is required by all employees to proceed with the plan.

Frost, Wakely, & Ruh [75] report three psychological conditions that are essential to the successful operation of the Scanlon Plan:

1. a clear identification of the organization's personality and objectives;
2. widespread opportunity for all employees to participate responsibly; and
3. realization by employees of a meaningful, regular, and fair equity in the organization.

Lawler [76] defined the process of design as the first decision facing an organization in setting up a gainsharing plan. He recommends that a design team, drawn from a cross-section of the organization, be utilized. These individuals should be credible and with strong communication skills. He reported that the development of a plan by the task force can take from three to twelve months. Some critical issues he sees are: where to set the goals, how the bonus pool will be divided, how frequently to measure performance for bonus purposes, what costs should be included, and how to handle radical changes in the environment and in the organization. Some of the areas in which Lawler believes that poor implementation can lead to failure include:

- formula construction -- must be adjustable to changing conditions;
- payout level -- must not be set so high as to cause frustration;
- management attitudes -- must favor participation;
- plan focus -- must include labor savings and other costs;
- communication -- employees should understand and trust the plan;
- union cooperation -- must exist if there is a union;

- supervisors' attitudes -- must be made comfortable in dealing with many suggestions and having their confidence tested in new ways.

In completing his analysis, Lawler noted that when, where, and how to install such plans must be based more on careful analysis and theory than on any hard data.

Installation and maintenance of such a program depends on key players being exposed early to the mechanics of the plan. Managers should prepare for inevitable complaints and a decline in suggestions and contributions [77].

Moore & Ross [78] also offer guidance to the decision-maker facing a Scanlon Plan as a means to improve operations. These researchers detail step-by-step instructions for implementation, which they define in five phases:

1. Information processing by management: does the plan fit the needs of the firm?
2. Staff meetings: is there sufficient consensus on benefits to proceed?
3. Analysis of experience data: develop the formula.
4. Presentation of the plan: company-wide dissemination.
5. Yearly evaluation and survey: is it working?

Ross & Jones [79] suggest that if a union is present, plans should be implemented within the context of the collective bargaining agreement. Further, LeSieur [80] cites a sample memorandum of understanding, which could be used to supplement the contract.

Scott [81] details start-up procedures for a Rucker Plan, which include a visual presentation to all personnel, small group meetings for

the purpose of answering specific questions, and establishment of plant productivity groups to facilitate communication. His approach is designed to get people involved and committed to the ultimate goals of the plan.

D. Common Sources of Gainsharing Failures

Moore [82] states that the most common causes of gainsharing plan failures have been due to difficulties with wage incentives or bonus achievement. Gibson & Lefcowitz [83] concluded that the chief reasons for failure were poor plan installation, poor understanding of the formula, and most of all, product mix effects on the formula ratio.

Gray [84] reported similar findings. He states that changes in product mix at an English auto body manufacturer resulted in usually no bonus paid and no increase in productivity. As a result, he questioned the role of the suggestion system aspects of the plan, reasoning that if it functions to improve productivity, it should work without a bonus.

LeSieur [85], however, found that as part of their suggestion system, workers searched for ways to improve business during hard times when no bonuses were being paid. LeSieur [86] believes economic motivation to be a major factor in success. He reports that overenthusiastic support for participation, along with unjustified disregard for the motivational impact of money, may result in failure of a plan. He added that if there is no near-universal desire by workers to participate in decision-making and to self-actualize, the ideology is not helped by emphasis on participation.

Jehring [87] found product mix and formula adjustments to lead to poor results, and also that management attitudes have significant bearing on commitment to the plan. Ruh, Wallace, & Frost [88] reached a similar

conclusion after a study of attitudes of management leadership of firms that had rejected or retained a Scanlon Plan. These researchers concluded that managers in organizations which had abandoned the plan held attitudes less favorable toward the abilities of rank-and-file employees and toward participative management, whereas managers who had retained the plan had more confidence in rank-and-file employees and more favorable attitudes toward participative management.

For most firms, implementing a gainsharing plan will cause a dramatic change in the way the firm manages itself [89]. Time and training are required in order for everyone, from the president down, to adjust to the philosophy of involvement. There is no doubt that commitment is a key factor, considering the time requirements for meetings as well as the need for communication, recognition, goal-setting, and education.

E. Summary

A literature review was made of some of the factors that lead to plan success or failure. There are arguments that firm size is a factor, but no consensus exists. Similarly, arguments are made pro and con whether participation affects results, with no consensus reached. There was also discussion whether success depended on consistent achievement of bonuses. Again, no consensus exists. There is evidence, however, that plans fail in those firms where management held less favorable attitudes toward the abilities of workers and toward participation.

These plans should not be seen as a substitute for an incentive system or as an end to bitter and antagonistic labor relations. Also, they do not offer a pat formula for automatic cooperation. The decision as to when,

where, and how to install these plans must be based on careful analysis and theory rather than on hard data.

After the firm decides to put in a plan, one of the most important factors to success or failure is the design of the plan, a process that normally takes three to twelve months. It was recommended that a design team representing a cross-section of the organization be used. These individuals should be seen as credible and have good communication skills. The team must address where to set goals, how frequently performance will be measured, and how changes will be handled. It is recommended that the program should be introduced to small groups of employees in order to gain better buy-in.

If a union exists, their cooperation and buy-in is necessary. Plans should be implemented within the context of the collective bargaining agreement.

Supervisory acceptance is a second factor that is critical to success if a participation system is installed. Since the role of supervisors will be changed, they must be comfortable in dealing with the many suggestions that will come, and in having their confidence tested in new ways.

A 1981 US Government Accounting Office study [90] on gainsharing concluded: "They warrant serious consideration by firms as a means of stimulating productivity performance, enhancing a firm's competitive advantage, increasing the monetary benefit of the firm, its employees, and reducing inflationary pressure."

Other studies cite lower employee turnover, absenteeism, grievances, and improved labor relations. Improved teamwork, quality, and employee attitudes and morale are also frequent outcomes.

Just as important as establishing a gainsharing program are the steps taken to assure its success. Steps must be taken that assure that the productivity program is institutionalized, i.e., new work practices that are employed over a long period of time and exist as part of the culture of the organization. Graham-Moore & Ross [91] summarize the following factors that contribute to the persistence of productivity and other similar types of labor/management programs.

1. Selecting Organizations. There are organizations that should not get involved in productivity-type change programs. Reasons for not getting involved include:

- (a) *Unstable economic environment.* Organizations that are experiencing economic instability and high fluctuation in their labor force will be hard-put to mount a successful long-run productivity program.
- (b) *Instability in leadership environment.* If there is likely to be turnover in key labor or management sponsors of the change program, it is best to delay or abandon the program.
- (c) *Mistrust between employees and management or union and management.* If there are some basic problems in the relationships between employees and employers or between union and management, a productivity program change effort should not be introduced. These problems need to be solved before a program such as gainsharing is considered.

2. Plan for Institutionalization in the Beginning. In most labor/management change programs detailed in the literature, attention is devoted largely to starting up a program. Little attention has

been given to maintaining the program. A program has greater chance of success if mechanisms for maintaining it are considered in the early planning stages.

3. The Fit Problem. There needs to be a good fit between the values, philosophy, and structure of the organization and the nature of the change program. For example, how does a low-trust, high authoritarian hierarchical system move toward a more participative system? The answer has to lie in a carefully designed evolutionary change program that will occur over an extended period of time.
4. Characteristics of Change. While no one program is suited to all organizations, the following are characteristics that should ensure a long-run effort.
 - (a) Specific statement of goals, written out and approved by both labor and management.
 - (b) Specific procedures to implement labor and management program activities. While these activities can be complex in nature, failure to clarify them could lead to trouble. Where feasible, there should be some formalization of issues such as who should be in the labor/management committee, when it should meet, how members should rotate, and what are the boundaries of the committee's work. Formalization increases long-run viability of the change program.
 - (c) Total system intervention: Change programs that can be introduced into the total organization unit, rather than in part, will last longer, but only if sufficient organizational resources are allocated to them.

5. Training Over Time. In addition to the initial start-up training, periodic retraining is needed over time in order to reaffirm the principles of program change.
6. Commitment. High commitment will facilitate the persistence of most labor/management change programs. High commitment comes from (a) voluntary participation in program activities; and (b) opportunities for recommitment over time. Productivity programs that offer continuous opportunity for recommitment exhibit higher levels of persistence.
7. Effective Reward Systems. The design of organizational reward systems can substantially determine the longevity of a productivity program. An effective reward system should:
 - (a) Include both extrinsic (e.g. pay) and intrinsic (e.g. increased autonomy) rewards.
 - (b) Link rewards to specific behavior required by the productivity program (e.g. assuming greater responsibility for decision-making).
 - (c) Introduce a mechanism for revising the reward system. It is unlikely that rewards will maintain their attractiveness over time.
8. Diffusion. As the productivity program is introduced in one unit (e.g. a department), it must be quickly spread to include all organizational units at one location. Isolated productivity programs will have trouble in persisting.

9. Feedback and Correction. A direct and accurate feedback mechanism for measuring performance of program activities is necessary if the change program is to adjust, grow, and remain viable.

Footnotes for Chapter 2

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CHAPTER 3

HAMILTON STANDARD: A CASE STUDY

A. Introduction

A.1 Company Background

Headquartered in Windsor Locks, Connecticut, Hamilton Standard is a division of United Technologies Corporation. UTC is a global company which ranks as the fifteenth-largest in the US. UTC's Aerospace and Defense products include commercial and military jet engines, helicopters, flight controls, spacecraft, and submarines, as well as military and air traffic control radar systems. UTC's Commercial and Industrial products include heating, ventilation, and air conditioning equipment for residential and commercial buildings, as well as elevators, escalators, and electrical and mechanical products for the automotive industry. UTC has facilities and offices located worldwide. Total employment is approximately 175,000, with annual sales exceeding \$21B. The company is publicly owned, and was founded in 1929.

Each UTC division is unique in gainsharing or profit-sharing. Some divisions have no gainsharing, while those that do may be similar or radically different.

The Hamilton Standard Division is probably the most diversified of UTC's divisions in terms of the target markets it serves. The company's domestic business is divided into two major manufacturing operations -- Aircraft Products and Space and Defense systems. The aircraft products operation is the focus of this case study, and has as its major products aircraft propellers, aircraft environmental control equipment, and jet

engine fuel controls, as well as digital electronic systems for aircraft including flight controls and guidance systems.

At the end of 1991 Hamilton Standard employed approximately 10,000 employees worldwide, which represents a major reduction from the 1990 employment level of 12,500 people.

Hamilton Standard was formed in 1920, when the Standard Steel Propeller Company combined with Hamilton Aero Manufacturing Company. In 1929 Hamilton Standard became a part of the UTC family of companies. The name of the corporation at that time was United Aircraft and Transport Corporation.

Like so many companies today, Hamilton Standard is approaching the 21st century with a company-wide commitment to a total quality culture. They are setting the highest standards of quality through a process of continuous improvement which they hope by 1994 to achieve the nation's most prestigious quality honor, the Malcolm Baldrige Award. Continuous improvement is the company's new culture, and it is changing the way business has historically been conducted. Included in this culture change is the adoption of a modified gainsharing program, called the Continuous Integrated Cost Competitiveness Process, or CICCPC, initiated in 1990. This program is an ongoing process that is gradually and steadily growing throughout the company. The new culture of continuous improvement entails a lifelong commitment that it is hoped will enable the company to achieve the vision and goals set by senior management to be an internationally recognized producer of high quality aerospace systems and hardware.

This chapter will report on the continuous improvement process of the company; CICCPC represents not only a business strategy but a means of

survival during times of increasing domestic and international competition.

Change and flexibility form the foundation of Hamilton Standard's evolving culture and of the new relationship it is attempting to forge with its employees. Flexibility will range from work schedules to broader job descriptions with the goal to provide employees -- an increasingly diverse workforce -- with more skills training and new compensation systems for meeting strategic business goals. At the same time, the changes are designed also to provide the company with the increased productivity of a high-performance workforce focused on improving quality, reducing product cycle times, delivering products on-time, and providing customer satisfaction.

As stated by the VP of Human Resources, "Change will become a part of everything we do. Flexibility is the key to our future success; we've got to be able to turn on a dime in the global marketplace to be competitive and survive" [92].

Changes are being made to both the technical and social systems at Hamilton Standard, in response to competitive pressures. The technologies applied to developing and manufacturing products, in terms of both new equipment and the flow of work, are being reshaped. Jobs are being broadened to allow more freedom to perform. Work cores, cells, and product lines are operating as teams, so that the company is becoming less and less dependent on just individuals doing work.

A.2 Interview Site Information

Interviews were conducted at the Farmington, Connecticut (or Building 4) facility of Hamilton Standard. This plant was chosen because it is one of only two Hamilton Standard plants that have been completely incentivized under CICCIP. This facility manufactures military and commercial flight control computers, guidance systems for spacecraft, and advanced electronic sensors for use in digital electronic jet engine fuel controls for commercial airliners. The Building 4 facility houses approximately 700 full-time employees, consisting of approximately 300 salaried and 400 hourly personnel. There is no union at Farmington; however, Hamilton Standard does have other facilities that are union-represented which have the CICCIP program in place, albeit primarily directed at salaried workers.

The Farmington plant is only one of two Hamilton Standard facilities that are completely incentivized under the modified gainsharing plan CICCIP to accomplish business process improvement goals. Employee teams comprising hourly and salaried employees from multiple disciplines have been empowered to redesign manufacturing processes in groups known as high-performance work teams, or project teams for short. This philosophy includes the reward of incentive pay for both teams and individuals who meet or exceed business goals involving process improvements.

The Farmington plant began operations in 1974. The modified gainsharing program was implemented in January 1990.

A.3 Personnel Interviewed

I interviewed the General Manager of the Farmington facility, who had been with Hamilton Standard for 25 years and had been in his present position for five years. He was responsible for the introduction of CICCIP at the Farmington facility. I also interviewed the CICCIP program administrator responsible for administering the modified gainsharing plan at the Farmington plant. In this role, the administrator keeps track of each team's progress in meeting pre-established targets and assists in the chartering of new teams. The administrator serves as a source of information on the specifics of CICCIP. I also interviewed two manufacturing technicians who had been with Hamilton Standard for six and eight years, respectively.

Finally, I conducted interviews with the President of Hamilton Standard, as well as the Division's chief financial officer and head of human resources. All three of these senior managers played integral roles in developing the CICCIP process, and are involved in its day-to-day execution.

B. Motivations Behind the Plan

The President of Hamilton Standard stated that the motive for installing the plan was to assure the company's ability to compete in the world market, and to attain best-in-class status as a company by the year 1994. The company attempted to convey to employees that they were not just looking to pay a bonus, but wanted to capture ideas and involve the employees on a continual basis. The level of improvement that senior management was looking for would require a dramatic step change from

present productivity and performance levels. A new way of working, as well as a cultural change, would be required, so that the everyday processes of doing hourly and salary tasks would have to be revamped and improved.

The overall goal of Hamilton Standard's continuous improvement initiatives is to motivate employees to work smarter, not harder, and to utilize people to their full potential. Senior management wanted employees to understand that it made no sense to offer a very high wage and then lay people off six months later, or to pay a high wage and lose business to a competitor. In communicating the details of CICCIP, management stressed to employees that being competitive was the only way that job security could be maintained. The company wanted a plan that would assure employee participation, increase their identity with Hamilton Standard, thus improving their understanding of their jobs and of the industry in which they compete. The intrinsic goal of CICCIP is to get employees to be "owners" of the business at all levels, and to work together in teams to foster process changes that result ultimately in making Hamilton Standard a best-in-class competitor.

Hamilton Standard's CFO noted that the typical project team goals for improving inventory turnover and product cycle times, and reducing scrap rework and repair, are linked directly to improving the company's bottom-line profitability. The intangible results of CICCIP come from the broadening of employees through empowerment and improved people skills all related to consensus management of cross-functional project teams, and an improved understanding of the business.

C. Plan Development

C.1 Development Participants

Early in 1988, senior management became increasingly aware that fundamental change was required in order to achieve long-term business success. As a result, a "Total Quality Leadership" objective for that year was elevated in priority, to form the structure for a fundamental culture change that ultimately would affect the entire workforce.

A survey/steering committee of six vice-presidents evaluated the philosophies and methodologies of the "quality gurus" and leading aerospace and commercial firms. They concluded, and all senior management agreed, that the "total quality" processes being employed were conceptually identical and centered on the ideal of continuous improvement. They involved teams to attack waste, improve processes that constitute the "system," and simultaneously attempted to maintain a sensitivity to customer needs.

The term "continuous improvement" was chosen to define the company's approach to the culture and system changes that were to take place, rather than a title that implied a program of finite duration or functional orientation.

Tennessee Associates International (TAI) was chosen as a consultant to oversee the implementation process. The steering team was enlarged to include the entire senior staff (approximately twelve vice-presidents) in order to achieve the desired across-the-board senior management awareness, commitment, and involvement in the process of change. All vice-presidents were involved in one of three pilot improvement projects, in order that they might more fully appreciate the training and development needs for

implementing continuous improvement, as well as to observe the benefits of process improvement teams.

After the "buy-in" by the entire senior natural management team, a steering team was organized to manage the ongoing implementation of continuous improvement. Membership of this implementation process team has rotated among members of the senior team. Members of the team have continued to visit "benchmark" companies (including Deming and Baldrige Award winners) as well as aerospace firms demonstrating success in converting their culture to one of total quality management/continuous improvement.

The team also appointed an administrator whose role was to develop a cadre of facilitators capable of conducting training, providing facilitation and consulting to natural management and project (process improvement) teams, and developing the support system necessary to implement continuous improvement.

The President noted that, while continuous improvement represents a culture change, there is also the need to develop a mechanism which holds employees accountable for the change process that the continuous improvement initiative had begun. CICCIP was developed as this mechanism.

C.2 Description of the Plan

Hamilton Standard developed a new management process known as the Continuous Integrated Cost Competitiveness Process, or CICCIP. CICCIP is an element of the company's continuous improvement process, and grew from the recognition that, while continuous improvement is a philosophy or culture, there is a need to translate this philosophy into specific process

improvement goals, with particular emphasis on making step changes in the way business is conducted. CICCIP focuses Hamilton Standard cross-functional project teams on achieving the highest levels of customer satisfaction while simultaneously achieving superior business results.

CICCIP focuses on making step improvements in those processes which cut across functions. An example of such a process is the new business proposal development process where Contracts, Cost Estimating, Pricing, Engineering, and the Program Office groups must work together to quickly and accurately prepare a proposal for customers.

The overall goal of CICCIP is for Hamilton Standard to become "best in class" (i.e. the best there is) in each process improvement initiated within a three-year period. CICCIP project teams use several tools to set and achieve their goals. Some of the tools used are:

- benchmark against other companies to set goals and learn what others are doing across several different industries;
- measure and communicate progress using arachnoid charts; these will be discussed later;
- emphasize who the customer is, both internal and external, and understand how he would measure the improvement in a particular process; and
- train in a full range of continuous improvement skills, including statistical process control, consensus building, listening, problem-solving techniques, meeting management, and process identification and analysis.

CICCP is an incentive-based program directed primarily at salaried employees (below executive level) to improve the company's performance in specific areas that substantially impact cost competitiveness, asset management, customer satisfaction, and investibility.

Responsibility for the overall management of the program, including final decisions regarding targets, participants, and payments, rest with the executive committee, which consists of the division CEO, CFO, VP of Human Resources, and VP of Strategic Planning. Other VPs may serve on an ad-hoc basis, depending upon the issues and teams under consideration.

The incentive aspect of CICCP is designed for teams responsible for meeting the various targets shown on their arachnoid chart. Figure 3.1 shows a simplified version of a top-level arachnoid chart which displays graphically the Farmington facility's primary measurement under CICCP. Hamilton Standard combines competitive comparisons with benchmark data using the arachnoid.

The arachnoid depicts the company's performance levels on key indices and their annual goals relative to benchmark and best-in-class companies. These charts provide the means to set goals, develop targets/benchmarks, collect metrics, improve processes, and provide feedback.

The division-level arachnoid showing its three-year goals is shown in Figure 3.2. Starting with the Division arachnoid, key objectives are flowed down to natural management teams at each level of the organization (see Figure 3.3). At each level, the legs of the arachnoid are structured to support a metric of the higher-level arachnoid. As described above, project or focused teams which are sponsored under CICCP are usually

ELECTRONICS MANUFACTURING CENTER - FARMINGTON

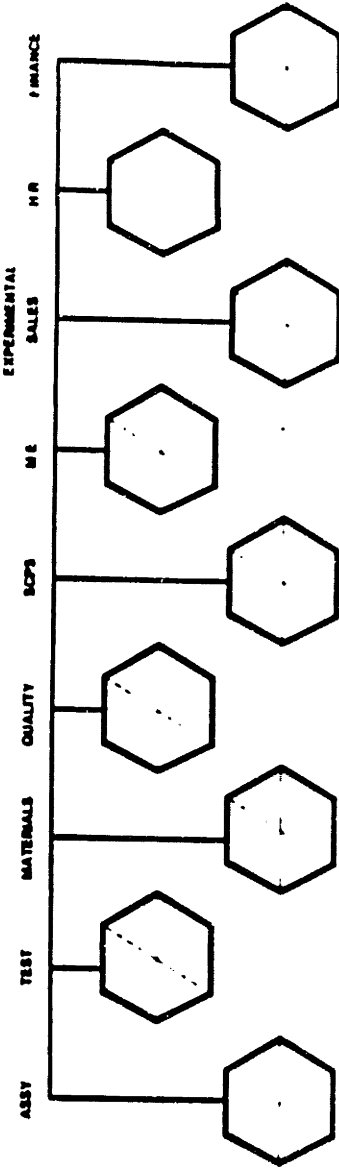
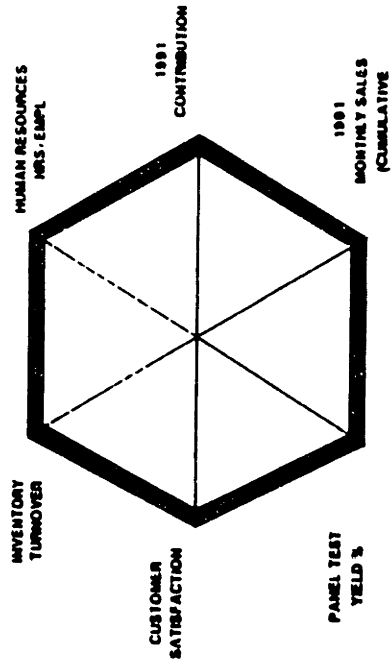
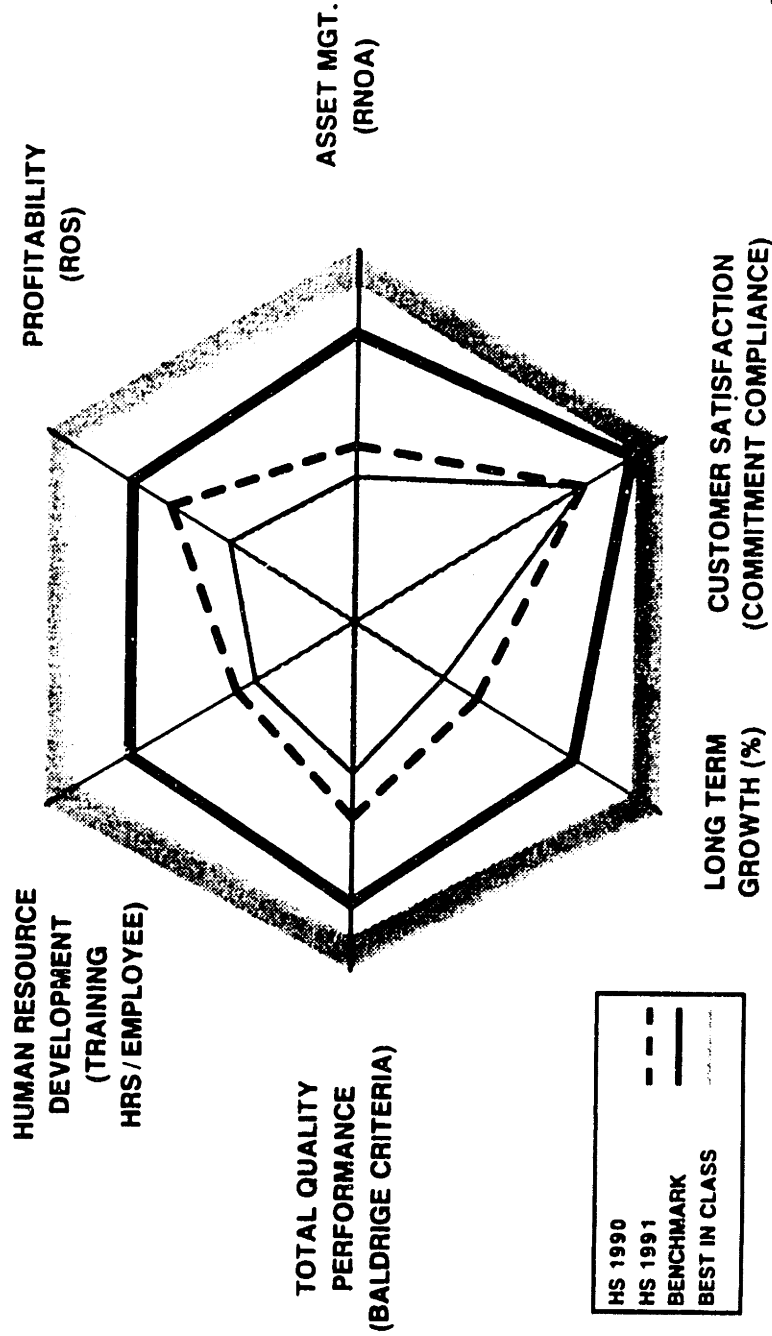


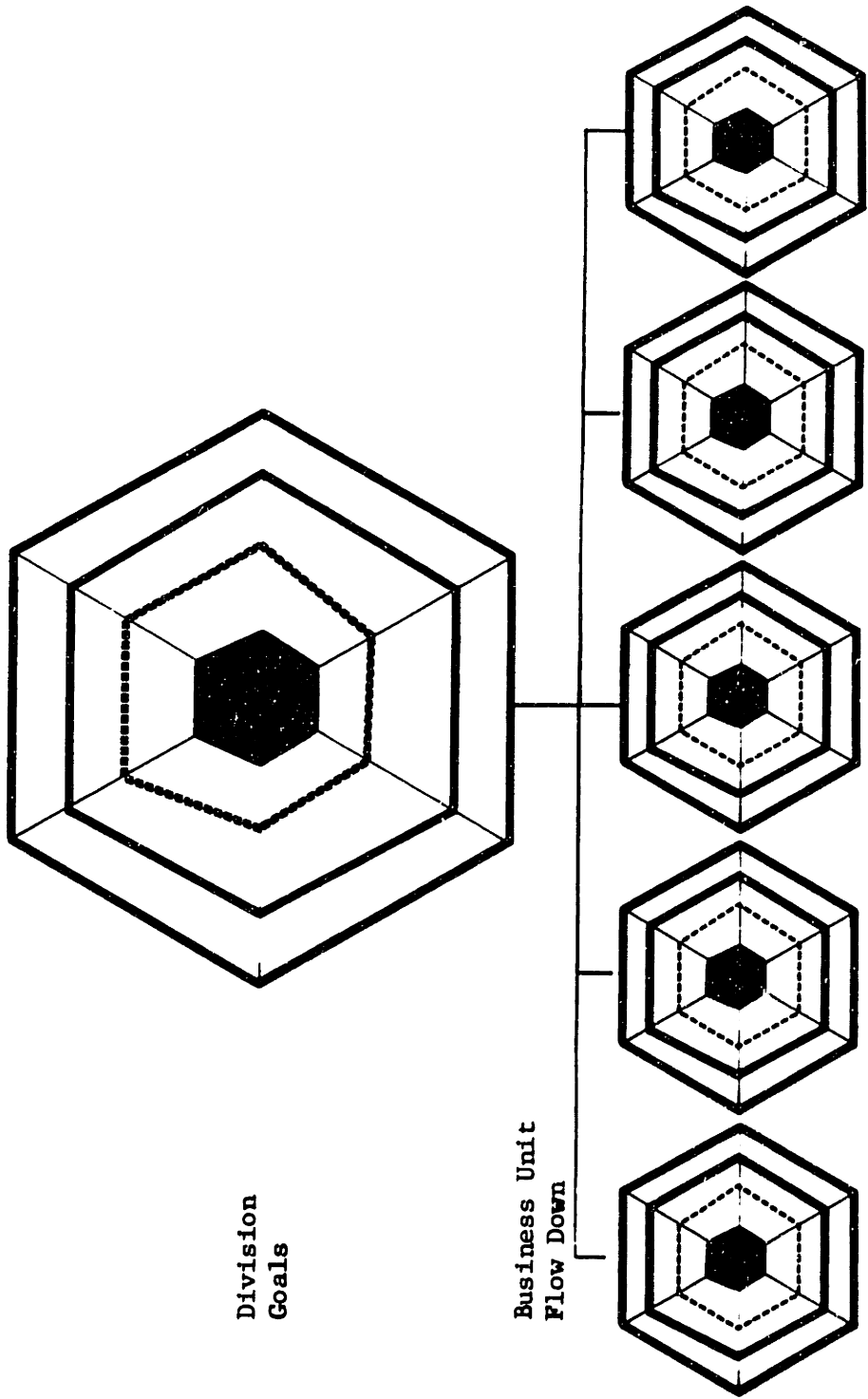
Figure 3.1
FARMINGTON'S CICCIP GOALS

HAMILTON STANDARD STRATEGIC BENCHMARKING



GFC1265 001

Figure 3.2 HAMILTON STANDARD DIVISION LEVEL ARACHNOID



Division
Goals

Business Unit
Flow Down

Figure 3.3 FLOWDOWN OF BUSINESS UNIT GOALS

cross-functional with representatives from various disciplines as required.C.3

C.3 Award Determination

Each leg of an arachnoid chart represents a goal or target, which if met by a project team will result in added incentive compensation over and above an employee's normal compensation. During the chartering process by which project teams are officially sanctioned, metrics and goals are submitted for a three-year period, showing a stepwise improvement to best-in-class levels by 1994. The executive committee must approve all teams and their goals, and each team is chartered for a one-year period only, since the second- and third-year benchmark levels will probably have changed and will require revision. Project team metrics should be measurable with precision, and must have direct bearing on cost competitiveness, asset turnover, customer satisfaction, and/or investment profile. Three targets for each metric appearing on the arachnoid chart must be submitted to and approved by the executive committee. The third-year target should represent "best-in-class" status. Teams achieving 100 percent of the targets will each be compensated as follows:

<u>Year</u>	<u>Time Period</u>	<u>Percentage of Salary</u>
1	1990-1991	4.0
2	1991-1992	6.0
3	1992-1993	15.0

These yearly awards are paid in a lump sum during the first quarter following the year of successful performance. The program's first lump sum payment (4%) is scheduled to be made on February 5, 1992. The administrator of Farmington's CICC program stated that an earlier award is preferred since it would make a greater impact on employees. However, 1.5 months are required to verify the results of the incentive program and to print and distribute the nearly 700 checks to the Farmington employees.

Since all project teams must support their business unit's top level arachnoid, awards are paid only if the business unit meets all its targets. So even if a Farmington team meets its goals, it will not be rewarded unless the entire facility is successful. This aspect of the award has the effect of increasing cooperation among various teams working under the same business unit.

I was interested to know whether there was any means of handling shirkers who participate on teams. While a team may earn an award, individuals on the team will not receive their share of the bonus if their overall performance rating (as determined by their supervisor) for their job is "Below Expectations" or lower.

The award process can be tailored to account for over-performing teams and teams that succeed only partially, as well as individuals who make significant contributions to several teams. The minimum award for partial success in any year is 2%, and the maximum award if all three years' goals are achieved in the first year is 25%. Individual awards are handled by the executive committee on a case-by-case basis, with a maximum award level over the three-year period being 50%.

C.4 Participation Process

Hamilton Standard's emphasis with its continuous improvement culture and CICCIP is on breaking down barriers between groups and giving people the opportunity to communicate their ideas, in both a team setting and individually. The focus on continuous improvement is to take the organization from a management style of control to one of involvement among its employees. CICCIP team members focus on the operation, maintenance, and improvement of their process, and are empowered to make decisions appropriate to that role.

Beginning with the chartering process, CICCIP teams are responsible for defining their mission statement, determining the make-up of the team, and doing the competitive benchmarking with other companies that forms the basis of their goals. So from the outset, CICCIP encourages ownership and employee participation. Figure 3.4 illustrates the tasks which are performed by team members during the chartering process.

The area of participation is where CICCIP deviates from typical gainsharing plans such as Scanlon, Rucher, or Improshare. Specifically, with CICCIP there is no employee participation on the executive committee, which is an analog to a typical Scanlon screening committee to process suggestions. This deviation is based on the long-term nature of CICCIP, and on its focus on process improvement instead of on monthly production targets or cost levels.

The CICCIP teams process employee suggestions on a consensus management basis without a formal suggestion review procedure. I believe this represents a key advantage of CICCIP, which does not require the formation of a (possibly counterproductive) bureaucracy for its operation.

DEVELOPING A CICCP TEAM

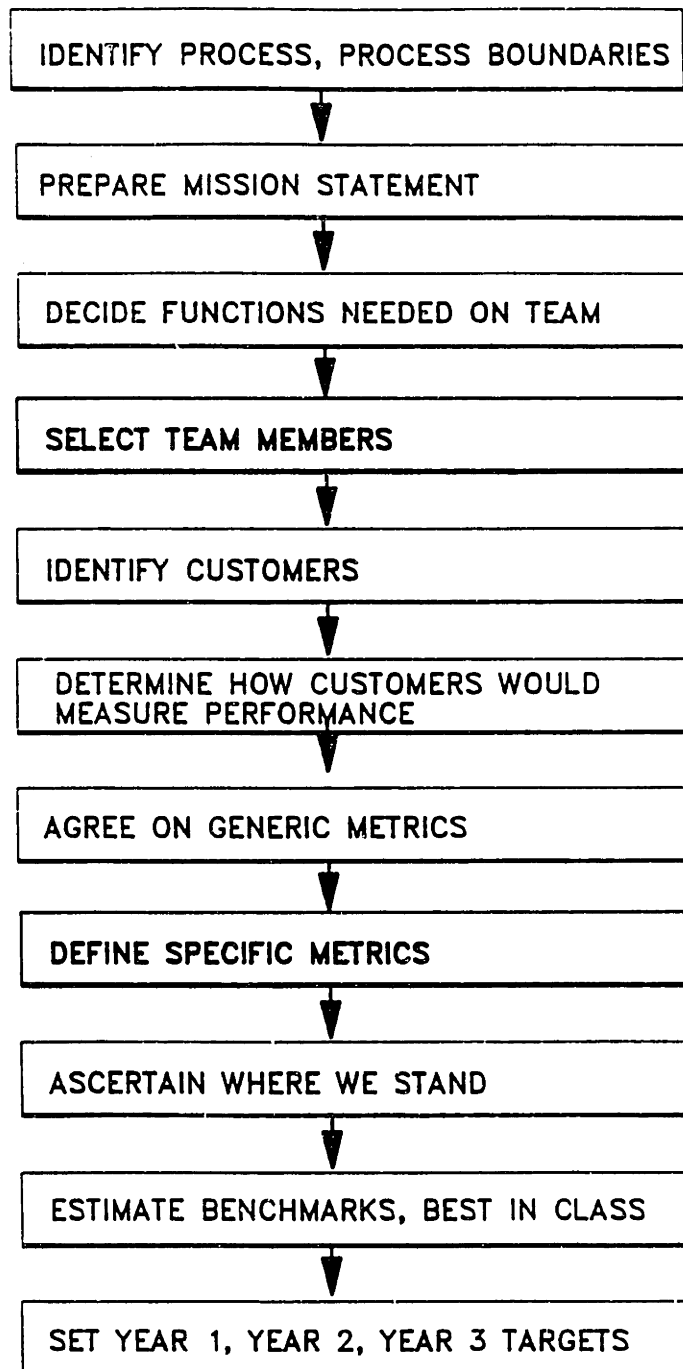


Figure 3.4

TEAM CHARTERING PROCESS

Of course, the downside is that employees may not completely trust the executive committee to do what is in their and the company's interest. There is a "trust-us" aspect to CICCPC which may be unsettling to some employees. However, I found no evidence of distrust during my interviews. Employees report to the executive committee their progress, as well as any major issue such as a capital investment suggestion, on a quarterly basis, by both oral and written reports. Presentations are generally fifteen to twenty minutes long, and focus on the six goals of the arachnoid chart. They also identify any significant bottlenecks and needs for senior management assistance. Results of disputes with CICCPC are handled either by the teams through consensus management or at the quarterly reporting sessions with the executive committee.

D. Plan Execution

D.1 Employee Introduction

The CICCPC administrator for the Farmington facility indicated that he and the General Manager gave comprehensive presentations to every employee, on all shifts. The presentation's theme was that CICCPC is the key to being successful despite increasing competitive pressures. CICCPC was pitched as a survival strategy that requires major changes in how people think and act.

The specifics of the program were described in very simple terms that were easily understood. The project team concept, award structure, and arachnoid matrix was described in detail to groups of 25 to 30 people at a time. A key aspect of the presentation was the use of Farmington's recent loss of a major contract they had held for several years, to a competitor.

This example highlighted the need for immediate action to improve processes and to reduce cost, schedules, and delivery time, which were the major reasons they had lost the contract.

The manufacturing technician indicated that it would have helped the communication process if employees were given more than one presentation to allow for a step-approach to the learning process.

For the most part, the plan was readily accepted by employees. I was told that a small percentage (10%) of employees resisted CICCIP and the entire continuous improvement philosophy as another mechanism for management to criticize employees and eliminate jobs. The program administrator noted that a second round of meetings was held in which management gave further details through real-world examples of how project teams would operate. This action apparently helped win over a large majority of dissenters.

I was very interested in whether supervision (foremen) resisted the plan as a threat to their typical job role. The program administrator indicated that several foremen rejected CICCIP because it meant relinquishing some authority as well as sharing with subordinates some of their traditional powers. The company arranged special counseling sessions for the foremen. This counseling helped to allay the foreman's concerns and has been officially incorporated into the CICCIP learning process. The General Manager noted that the foremen should have been involved sooner in the development of Farmington's plans.

D.2 Program Changes

Should it be necessary to make changes to the program, these would be presented to the executive committee for discussion and would be communicated to all employees prior to the implementation through the normal information chain.

D.3 Management Involvement

Both technicians indicated that management is very involved in the entire process. One remarked, "This is one of the keys to the plan's success. Both sides are involved and support it totally." The head of human resources confirmed that senior management was very involved, primarily through the executive committee meetings that charter and monitor teams. The Farmington General Manager stressed that he spends approximately two hours in the plant each day just talking with employees, and that on an aggregate basis he spends nearly 25% of his time on continuous improvement initiatives and CICCIP.

A recommendation was made by one employee that management in Farmington could further enhance their involvement by assisting with red-tape issues that may hinder a project team from implementing some changes, particularly if these changes require effort by departments who are not represented on that team. Project teams participate in the incentivized CICCIP program.

D.4 Employee Training

Training of employees is based on two fundamental precepts: a cascading of natural management team training from top to bottom of the

organization, and providing skills training for project teams and individuals on a "just-in-time" basis.

Natural management teams (NMTs) are existing organizational teams consisting normally of a leader and his/her direct reports. Project Teams (PTs) are teams chartered by natural management teams in order to improve a specific process identified by the natural management team.

Natural management team training began with the senior management team in the fourth quarter of 1988 and continues through the organization in 1992. Project team training consists of off-site sessions from three to eight days' duration, and focuses on team development and process identification and improvement. In addition, familiarization with fundamental Q/C tools (such as flowcharting, brainstorming, nominal group technique, cause-and-effect diagrams, check sheets, Pareto charts, run charts, control charts, and histograms) was included in all natural management and project team training sessions.

Early sessions were conducted by a consultant; by mid-year 1991 training self-sufficiency was achieved with Hamilton Standard facilitators capable of conducting all training. In the last quarter of 1989, a two-day project team training course was developed and added to the NMT three-day course training. By the end of November 1991, 538 NMT and PT (392 and 146, respectively), comprised of 4,054 employees, had been trained. Fifty-three facilitators had received formal and on-job training and were providing consulting and facilitation support to teams as well as conducting off-site training on a full-time basis. Of these 53, 23 have been seeded back into the organization to continue to instill the philosophy of continuous improvement.

Hourly workers in Farmington receive eight hours of training in an off-site facility. The manufacturing technicians felt this was sufficient to work effectively within the framework of the project team and to effect real change. A unique feature of Hamilton Standard's program is that additional training is at the discretion of the project team, but must be approved by the executive committee.

D.5 Communication Process

The Hamilton Standard vision, strategy, goals, and arachnoid (the Hamilton Standard vehicle used for benchmarking) are clearly defined and publicized on a wallet-sized card which has been distributed to all employees. This format was chosen so that the vision would be accessible to each employee. The vision detailed on that card is further reinforced during weekly, monthly, and quarterly NMT meetings at all organization levels, designed to keep the workforce informed and focused as well as to promote feedback on any and all issues.

Each department at Hamilton Standard utilizes bulletin boards which display the mission statements, arachnoids, and Statistical Process Control charts (SPCs) of various continuous improvement (project) teams. These bulletin boards are constantly updated to show the teams' progress.

Other means of communicating the quality values and CICCIP results within Hamilton Standard include:

The Standard: the company newspaper, published approximately ten times per year;

The Standard Update: published as necessary to share with employees timely news items;

General Notices: published by the senior executives as necessary to announce quality educational opportunities, promotions, and miscellaneous news items;

Dialogue: the confidential-two way communication system used by employees to express their concerns about the company in an anonymous way.

All employees interviewed said that the level of communication and feedback within the company was good, and that communications had improved markedly since the initiation of CICCPC. Particular praise was noted for senior management in their communicating the present rapidly-changing business environment of the aerospace/defense industry. As stated above, Hamilton Standard has reduced its total Connecticut workforce by nearly 20% during the past eighteen months. The President of the company is a strong advocate of company news, as reflected in his statement that "you can never overcommunicate, particularly in the tough recessionary and competitive period we are in." A sample of an internal communications memo regarding the declining defense budget is shown in Figure 3.5.

E. Influential Factors

E.1 Firm Culture

Perhaps the most important variable concerning the success or failure of gainsharing programs lies with the firm's culture. Discussions with managers and employees gave a clear picture that Hamilton Standard is attempting to change its culture from that of a non-participative hierarchical organization to that of a participative and team-oriented

Figure 3.5

Internal Company Correspondence

February 4, 1992

Dear Fellow Hamilton Standard Employee:

There is a great deal of speculation among employees about announced and possible defense budget cuts, their effect on Hamilton Standard and on future work force reductions here. As we see it today, the reductions called for by President Bush in his State of the Union address and by Defense Secretary Cheney the following day should have minimal effect on production levels at Hamilton Standard this year and next.

However, we need to be cautious beyond 1993 and through the end of the decade when production slips in Comanche and other key programs could affect us. Most importantly, we need to keep the business we have, especially military propellers for the C-130 and P-3 aircraft and our Space Station life support equipment.

On January 22, you received details of Hamilton Standard's plan relative to UTC's restructuring. Our plan included the divisionwide reduction of 950 jobs. While we began the reductions last week, it is our intention, barring any major economic catastrophe or significant loss of business, to complete further reductions through attrition and voluntary separation programs.

We have much more work ahead -- our efforts to reduce costs and increase our competitiveness will only grow more intense as competition increases and we expand in our global markets. But we have a clear vision and a plan to make ours a stable, investable company. Let us move forward together to make Hamilton Standard the preferred supplier of all our products and services around the world. We're counting on your help; we will succeed only as a team.

President

organization with a focus on customers, employee involvement, teamwork, and process improvement. Figure 3.6 depicts the culture change that Hamilton Standard is pursuing.

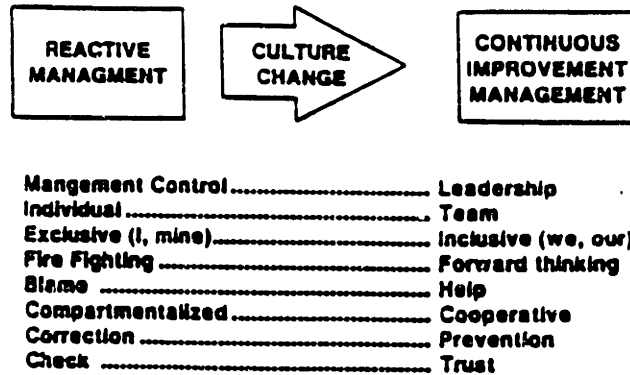


Figure 3.6

Continuous Improvement

Changes have been made within the past year which point to this culture change, including the elimination of parking areas designated by labor grade. In addition, major investments are being made in training, upgrading plant and equipment, and the move toward decentralized focused factories with very flat management structures, as well as in the creation of multi-disciplined customer-focused business units. These moves reflect the company's beliefs that the best management is self-management by people who know the job.

A number of social events are part of activities, although these functions are primarily departmental.

Hamilton Standard has an employee assistance program to assist any employee with personal problems which could affect work performance. This program provides psychological counseling, outside and inside group therapy, stress management assistance, and referral intervention for substance abuse, mental wellness, and personal/family matters. The company owns and operates a recreational facility which is home to physical fitness programs and features an array of fitness and aerobic conditioning equipment and classes. The facility includes also several play areas for softball, volleyball, and tennis, and supports an extensive intramural sports program. Picnic facilities are also available for employees and their families.

Another aspect of change toward a continuous improvement culture are many rotational/developmental programs for hourly and salaried personnel.

E.2 Wage Factors

CICCP is structured so that the bonus is in addition to the basic wage rate for the three-year life of the program. Also, yearly CICCP bonuses are not taken into account when the next wage increase is being considered. The head of human resources said that this aspect of the program will most likely change at termination of the three-year period; however, the company has not yet decided what form this change will take.

The manufacturing technician noted that most employees feel that the bonus levels are fair. He added that the amount is not really as important as the fact that employees were finally being recognized for their contributions.

E.3 Business/Economic Conditions

Due to the recessionary economy and the fact that aerospace companies are restructuring and downsizing to meet expected lower levels of defense outlays, there was a general fear for job security among hourly and salaried employees. As stated above, during 1991 the company reduced its workforce by nearly 20% through layoffs and attrition.

The head of human resources noted that while employees are apprehensive, these feelings have not affected productivity levels. Also, since the average project team ranges from eight to ten employees, the layoffs have not impacted team productivity.

One of the manufacturing technicians said that the added level of tension brought on by the economy has caused employees to work harder and longer hours as a means of increasing job security. I believe that this attitude is a short-term phenomenon. If the level of tension remains high over a three- to six-month period or more, productivity would eventually fall off.

E.4 Management/Employee Relations

The General Manager felt that management/employee relations were good prior to implementation of the plan, and they have remained good. He attributed this to the fact that the facility is off the main company campus, which results in a tight, cohesive family attitude among employees. He praised this family atmosphere and level of trust as a key factor in the successful implementation of CICCIP.

The manufacturing technicians thought there was a genuine desire, both before and after implementation of the plan, for employees and

management to work together. They felt also that there was trust between management and employees at the time the plan went into effect. The General Manager noted that the absence of a union played a key role in the successful implementation of the plan. The Farmington facility is one of two off-site plants that are non-union. A large number of the company's production workers are located at Headquarters in Windsor Locks, Connecticut, and many of these workers are members of the United Association of Machinists Union.

As a company, union-management relations are strained. This is evidenced by a recent grievance filed by the union against the company's continuous improvement initiatives of project teams and CICCIP. The head of human resources acknowledged that there is presently a low level of trust between union and management which will hinder the participation of hourly workers in improvement initiatives at represented locations; particularly CICCIP which effects wages, hours, and working conditions as stipulated by the NLRB. On the other hand, the head of human resources said that there are a large number of hourly non-union employees who want to participate. In fact, there are some project teams with hourly workers, but they are prevented from participating in the award process due to the present collective bargaining agreement.

E.5 Plan Variances

An especially interesting aspect of CICCIP is that, while the three-year award levels are equivalent across all teams, the specific goals and performance improvement targets vary. I wondered whether this may cause a feeling of discontent within the organization. The general manager and

the head of human resources both noted that this was not a problem, since targets are developed based on work processes specific to individual teams. It would be difficult for teams to make an apple-to-apple comparison, so discontent is not an issue.

However, plan variability exists at the business unit level. Some units have instituted CICCIP differently, such that award levels differ substantially. As an example, the company's Space and Sea Systems (S&SS) unit has implemented a one-year variant of the three-year baseline version of CICCIP. While this variance is due strictly to the way business is conducted in the S&SS unit (e.g. cost-plus government contracts vs. commercial fixed price), employees may not view this as a legitimate enough reason and feel that they belong to the "have-not" group. This could lead to defections from the S&SS department; or worse, negative feelings and declining productivity levels could result. The head of HR acknowledged that, while not a concern now, it could develop into a problem over the long term when the higher award levels become effective (in 1992 and 1993)

E.6 Employee Control and Understanding

Both manufacturing technicians interviewed stated that the bulk of the employees feel they have control over their business results so they have control of their team's targeted performance levels. They highlighted this feeling as a key motivator for the success of CICCIP. One technician added that attempts to make real improvement in his team's processes take too long to implement due to "red-tape" administrative problems.

Responding to my question of whether employees understand the targets and benchmark goals, the HR VP noted that certain teams must meet several times with the executive committee before being chartered -- but that all employees eventually understand fully the details of the plan.

F. Results

F.1 Plan Acceptance

F.1.1 Interviewee Feelings Toward Plan

All employees with whom I spoke had been personally in favor of the plan when they first became aware of it. This acceptance was based in large part on the recognition that something was needed to make the company more competitive -- the feeling that CICCOP is a survival strategy was dominant.

F.1.2 Supervisor Resistance

Related to middle management and supervisory resistance sometimes apparent with these plans, the general manager indicated,

There are some risks at the supervisory [foreman] level. Success is based on people being able to talk to supervisors and the supervisors taking action. Some supervisors are not ready for the additional responsibility. In these situations, senior management needs to watch that closely and be ready to take corrective action, since supervisors can snuff out a program like this.

The CICCOP plan administrator in Farmington noted that the supervisor's changing role demanded more training resources focused earlier in the program than what had actually been given.

The head of HR noted that when CICCIP was implemented, some middle managers had resisted. But after they found employees were able to get involved, it took some of the burden off their shoulders and they became more supportive.

F.2 Prerequisites for Success

One question I was very much interested in was whether employees felt that any prerequisites were necessary in order for these programs to succeed. The general manager told me that a major problem or crisis must take place before successful organizational change can occur.

The chief financial officer answered my question in this way:

One thing unique about CICCIP is that trusting relationships are mandatory. You must have flexibility. It is important that people know what you are doing and that you communicate goals, results, and expectations. These plans won't work in a company that's highly centralized or highly secretive, or does not have a high regard for people. It works best in a company that wants and encourages participation.

When I asked one of the manufacturing technicians whether a certain culture is needed for the success of these plans, he answered that "a lot of openness and trust is needed, and a culture needs to exist encompassing this in order for it to be successful. Hamilton Standard is on the right track, but we're not there yet."

Concerning whether a union vs. non-union atmosphere would affect these plans, the president noted that the union is an impediment to success. He commented that "the union's number-one and -two objectives are job security and collection of union dues. They are a company in their own right, with different objectives from those of Hamilton

Standard. The union sees itself as a public defender and will therefore never embrace the philosophy of continuous improvement or the mechanics of CICCIP."

Relative to recommending a program such as CICCIP for other companies, one manufacturing technician said he would if the employees and management were really willing to work with it. He said, "if either side is 'iffy,' you will be spinning your wheels. You can't separate results of the plan by itself and say that good results were due strictly to the plan."

The chief financial officer said that if you considered a plan such as CICCIP or gainsharing, be sure to put a measurement against it so you can see what progress has been made. He reiterated the need for total commitment from both sides.

F.3 Before/After Data

I was interested in learning about the intangible benefits of CICCIP, more than about specific process improvements.

All interviewees responded that without question CICCIP improves the overall quality of management at all levels of the organization. The president noted that this is a result of focusing on process improvement rather than profit or volume-related goals, typical of Scanlon-type gainsharing formulas. The chief financial officer noted that CICCIP not only improves management skills, but also has the effect of broadening all employees to have a better understanding of their jobs as well as feeling better about themselves in terms of making an impact on the bottom line.

Tangible process improvements, after just one year of CICCIP, cut across all departments within Hamilton Standard. Typical examples of data

used to trend the successes of project teams include customer acceptance rate or satisfaction, overdue deliveries, work-in-process (WIP) cycle time, test/inspection yields, engineering changes, and material review activity.

Customer acceptance rate is a customer measure of the quality of products shipped. Product reliability data is one category to measure customer satisfaction.

One engineering project team developed a product troubleshooting guide which when used by airline maintenance personnel led to a 300% increase in the time between unscheduled removals for a particular part critical to the operation of aircraft propellers.

On-time delivery is monitored through the use of the production overdue metric. The overdue trend data for the electronics and mechanical areas have shown improvements of 73% and 43% since January 1990.

During the twelve months of 1991, Hamilton Standard project teams obtained improvements in yields in both the testing and inspection areas of five major manufacturing areas, from under 60% to over 75%.

These examples are typical of the improvement being made on the factory floor. However, CICCP project teams are also at work in the office areas of Hamilton Standard. An example is a project team working to improve the errors made by the internal financial reporting system. This is a system on which many business actions are based, so its timeliness and accuracy are critical.

CICCP has been implemented only one year at Hamilton Standard's Farmington plant. The facility reached, and in many instances exceeded,

its 1991 first-year goals. These results, as well as the forecasted 1992 and 1993 CICCIP goals, are shown in Figure 3.7.

F.4 Employee Feelings

When asked about the employees' feelings toward their job, the head of HR indicated, "People like it because there isn't a third party involved and they can implement decisions. People see this as a way to have input." The chief financial officer commented, "office workers feel they are a part. Everyone realizes they are all in this together."

I was very interested in understanding the opinions of employees relative to the optimum size of a company for a program such as CICCIP to be successful. The only person who could answer this question was the president, who had previously worked at plants which had traditional gainsharing plans in place. He stated that the ideal size of a plant should be a focused facility of 1,000 or less employees, preferably non-union.

Regarding the plan's effect on worker cooperation, communication, and participation, the manufacturing technician felt that cooperation would be good without the plan, but is enhanced by it. The chief financial officer said this sort of plan opens many doors to communication and cooperation.

When I asked what were viewed as major benefits and negatives of the plan, all responses were positive, with this one exception from the chief financial officer. He noted that CICCIP was only in its first year, so that it still qualified as being in the "experimental" stage. In general, first-year results were very rewarding for employees with most participants receiving the 4% first-year award or a portion of it. With

Figure 3.7

Farmington Electronics Manufacturing Center

KEY PERFORMANCE METRICS					
% Improvement or (decline) from baseline year 1990					
METRICS	MEASUREMENT	12/31/91 RESULTS	12/31/91 PLAN	12/31/92	12/31/93
Customer Satisfaction	On-time delivery Times Customer Acceptance Rate	42%	33%	50% est.	65% est.
Sales	Cum Monthly Production Shipments	35%	18%	--	--
Contribution	From P&L	29%	29%	--	--
Inventory Turnover	From P&L	(13%)	(6.7%)	10%	25%
Panel Test Yield	1st Time Acceptance at Functional Test All Panel Assemblies 6-Month Average	75%	75%	80% est.	85% est.
Human Resources	Employee Development (Hrs per Employee)	31%	19%	67%	90%

these results, the CFO is concerned that employee expectations for a continued bonus payment could be dampened by the possibility of poor company or business unit performance in the future.

Many major benefits were cited by the interviewees, some of which are summarized as follows:

- encourages employee participation and feelings of ownership;
- encourages competitive analysis through benchmarking, thus broadening employees' understanding of the business;
- award levels are not profit or volume (sales) sensitive -- therefore the program is less sensitive to external influence (e.g. energy costs, material costs, downturns in the business cycle);
- invests in human capital and develops a skill base through training in team development and process identification and improvement, encourages the use of quality tools;
- enhances cooperation and communication at all levels;
- makes the company a more enjoyable place to work;
- encourages and rewards job knowledge;
- simple to comprehend; does not involve complicated formulas;
- does not require internal bureaucracy to run (ala Scanlon plans).

G. Personal Observations

I made the following personal observations during the interviews:

- All employees interviewed, hourly to senior management, showed great enthusiasm and were positive on the program.

- The recession and declining defense business have not interfered with the implementation of CICCIP, but on the contrary, have heightened employees' recognition that it is a requirement to remain competitive and secure jobs.
- All displayed good knowledge of plant operations.
- I sensed pride in accomplishment by all interviewed.
- Workers throughout the plant seemed to enjoy their work.
- During a cafeteria lunch with Farmington's general manager, I was impressed that employees sat with us and communicated openly. There was no shunning of the management people as visitors. Also, as I toured the facility with the general manager, employees were quite friendly and open to talk.

Footnote to Chapter 3

- [92] The Standard, Hamilton Standard Company newspaper, 4th Quarter 1991,
p. 6.

Chapter 4

Summary and Conclusions

A. Summary

A summary of Hamilton Standard's variant of gainsharing known as CICCIP is shown in Table 4.1 (below).

Rather than go through all the details of the plan, I will summarize what I learned in my interview with Hamilton Standard's senior management and operating personnel at their Farmington facility.

Table 4.1
Summary of Plan Elements
(Farmington Facility Only)

1. Employees involved in issues of fairness	No
2. Participative management	Yes
3. Employee support for program	Good
4. Employee description of labor/management relations	Good
5. Employees involved in planning	No
6. Workers feel they can influence targets	Yes
7. Employees have similar targets and goals	No
8. Formal system to keep employees informed	Yes
9. Formal worker feedback during development	Yes
10. Worker vote on implementation	No
11. Employee layoffs	Yes
12. Bonus unaffected by wage increases	Yes
13. All workers participate directly	Yes
14. Major plan evolution	No
15. Award period	1 Year
16. Time to develop	4 Mos
17. Number of employees	Roughly 700
18. Union	No
19. Year program began	1991

Geographic location and whether the firm is unionized have had a lot to do with the success of Farmington's CICCIP program. Being located as an "island plant" several miles from the company's headquarters has led to an increased sense of trust and team spirit at Farmington. Being a satellite facility often means having fewer workers than the main plant; this is true in the case of Farmington which has only 700 employees, vs. 9500 in the Windsor Locks office and manufacturing complex. Smaller organizations such as Farmington tend to have less of a tiered management structure and fewer middle and upper management perquisites such as separate cafeterias and privileged parking areas that tend to alienate employees from executives.

All of the factors discussed above have contributed to Farmington's meeting all first-year goals under the modified gainsharing program. The fact that Farmington is non-union is also a key success factor under CICCIP. This can be seen at the company's headquarters in the poor relationship between management and the union. The recent NLRB charge brought by the union against Hamilton Standard is clear evidence of the lack of trust between these two groups. Farmington's success is clearly due in large part to being free of that pressure.

Lay-offs do not appear to have an impact on the plan. Hourly workers, when interviewed, pointed out that lay-offs heighten awareness of the need for CICCIP as a survival strategy, and not as just another management program to improve quality.

Plans such as CICCIP will not work in a company that is highly centralized, secretive, or with no regard for its people. Success is related directly to trust, cooperation, and commitment of the parties

involved. These plans in themselves will not accomplish that. Instead, they must be a part of a larger plan that builds these aspects. Listed below are some ways to achieve this.

Worker involvement shows management's desire to cooperate. The use of project teams to effect real changes in the process of how day-to-day business is conducted appears to be an effective method of getting worker buy-in and trust. The development goals based on workers actively participating to benchmark best-in-class companies provides objectivity and adds trust. This is a significant area where CICCIP deviates from Scanlon-type gainsharing plans which typically use profit, volume, or cost target goals based on historic performance.

I believe that CICCIP has a big advantage in this area, which is to enlighten the workforce on the same competitive information formally known only to upper and middle management. An external focus also keeps the workforce abreast of the latest technology and process improvements.

One downside to CICCIP vs other gainsharing plans is that while workers are involved through the goalsetting and continuous improvement process, there is room for additional involvement on the executive steering committee or through a formalized dispute resolution procedure. One of the few negatives expressed by employees with CICCIP is that implementation of change involving multiple departments (disciplines) can get bogged down in red tape. An employee/management team may help to break this type of 'log jam,' as well as any administrative disputes that could come up. When addressing this issue the company will have to tread softly, because any changes made along these lines could be interpreted by the LNRB as an intent to form a company union, which is illegal.

Hamilton Standard's CICCIP process runs a risk, although minimal, of being perceived by employees as strictly a management initiative which sets the rules, dictates all changes, decides award levels, and resolves disputes. The recent decline in the aerospace business has helped the company to obtain worker buy-in. However, as the business cycle improves, it may find it more difficult to effect completely the desired continuous improvement culture change.

These worker involvement issues will need to be addressed when management and union discuss a compromise solution over continuous improvement. This effect is a necessity if the company is to reach world-class manufacturer status. However, while worker participation schemes are important, they can quickly become bureaucratic in nature through the establishment of excessive numbers of committees. This could backfire and create a barrier to the continuous improvement culture being fostered by Hamilton Standard senior management.

Communication of results and what management is trying to accomplish is critical to success. This should be done on a regular basis by means of continued internal memos from the president and articles in the company paper, as well as through project team feedback sessions.

It is essential that workers understand that they can impact target areas and that goals are achievable. The award period should be short enough to keep employees interested. Payment by a separate check separates, in the minds of the workers, the bonus from normal wages. Prompt payment following the award period emphasizes the performance. Wages should not be impacted negatively, at least initially by the plan, since this could lead to distrust. It appears that bonus results can

impact future wage increases without detriment, provided workers realize what is going on and are communicated to. It is critical that employee expectations are kept in check.

CICCP and other gainsharing variants do not turn a plant into a democracy. Someone still has to be responsible. The general manager at the facility is that person. He needs to be involved with the system and to look after it. Management must be willing to allow time for training and meetings and be involved in the project team (in the case of CICCP) or other employee participation systems. If a participation system exists, it provides a good forum to decide on program changes and communicate these to all workers involved. If goal adjustments become necessary due to technology or other changes, they should be based on experience and a solid competitive database.

Training must be a part of the process. Workers should be given tools to compete if they are to be held to competitive benchmarks. These tools must include not only quality improvement techniques such as SPC and flow-charting, but also personal interaction skills that will help people to adjust to group process improvement and interaction. A good example is training which helps supervisors and middle managers to adjust to their new roles and responsibilities. Team members will need training also in problem-solving, team concepts, motivation, and other problem-solving skills. Re-training is also important to convince employees that the company is interested in making long-term investments in people -- the most important asset in a business.

Employees and supervisors will experience increased pressure under these programs because they know that their actions will influence the

bonuses of their co-workers. Resistance from supervisors and middle-management can defeat programs. Senior management must watch these levels closely and not let that happen. Supervisors are likely to accept the program once they understand that employees can contribute, which then makes their jobs easier. Through communication supervision must be made to recognize they will retain their normal duties and will also serve as a coach and facilitator. Management must be aware that some supervisors will feel threatened if their employees make suggestions. Supervisors should be applauded when their group makes suggestions.

B. Success/Failure Hypothesis

There is no doubt that the Farmington electronics facility of Hamilton Standard has a modified gainsharing plan which has shown successful results during the first year. Of course success is a relative term that is not easily measured. The data shows clear improvements in such business metrics as customer satisfaction, sales, contribution margin, inventory turnover, panel test yields, and employee development.

In addition to these hard numbers, the Farmington plant has seen significant improvement in employee knowledge and commitment to the business. During the interviews I found extreme enthusiasm and genuine belief in almost everyone I spoke with. Although the literature describes this, I would not have truly believed it had I not witnessed it first-hand. After just one year of implementation, Hamilton's CICC process has stimulated productivity, enhanced the firm's competitive position, and improved quality and teamwork, as well as improving employee attitudes and morale. The head of human resources noted that company-wide turnover,

lost time incidence rate, and worker's compensation claims are all down versus the rates for previous years. These positive trends cannot be statistically shown to result from the company's continuous improvement initiatives, but they are all healthy trends that cannot be ignored.

The question to be answered is whether CICCOP can continue to gain momentum and show positive results over the long haul. As stated by Graham-Moore & Ross (see Chapter 2 of this thesis), just as important as establishing a gainsharing program are the steps taken to assure its success. They note that steps must be taken to insure that the program is institutionalized, i.e. that the new work practices are employed over a long period of time and exist as part of the culture of the organization. I believe that CICCOP meets the majority of the nine critical success factors to the success of gainsharing, as noted in the Summary of Chapter 2.

However, programs such as CICCOP are not themselves what make companies and people improve. These types of plans must be part of a larger plan, one which the company sees as utilizing workers to their fullest capacity and by doing so giving them greater fulfillment as well. Plans such as CICCOP can, nevertheless, help firms to move in this direction, provided management has a sincere desire to do so.

Each firm must assess its own culture to determine if it has the right climate to make the plan work. The use of outside consultants to help in this analysis may be possible. If the culture does not exist, the consultant might point out what needs to be done in order to develop it.

C. Suggestions for Improvement

Looking beyond the Farmington facility, the long-term success of CICCIP hinges on the ability of Hamilton Standard to make peace with the union and involve it in the process of continuous improvement. This will require a tremendous effort, as well as concessions on behalf of both sides to work out a mutually agreeable position.

Union buy-in and support is critical to successful implementation, because the majority of production workers are covered by a collective bargaining agreement. This group represents a tremendous opportunity for the company in terms of utilizing workers to their fullest capacity and reaping the rewards of their involvement. No doubt it will be necessary to incorporate the plan into the collective bargaining agreement. However, I believe it is best to avoid negotiating the plan as part of normal contract negotiations because the plan then becomes buried within other detail.

Another area for improvement deals with the several variations of CICCIP that exist in the company. There is no reason to believe that the existence of common goals for all employees is a prerequisite. However, it does appear important that all employees performing similar work have similar targets and goals unless separate facilities or departments are autonomous and do not share a common link. While the overall emphasis in implementing CICCIP is to have each business unit manage its own variation of plan, there is a risk of dividing the employees into groups of 'haves' and 'have-nots.' This would probably occur as whole business units, such as Farmington, receive their bonus awards. In all instances, however, it

is critical that employees understand that they can influence the target areas and make an impact.

One further improvement might be to strengthen the process whereby individual contributions are celebrated, in addition to the acknowledgement of team effort. Gainsharing plans often can have the reverse effect of their original intent. By treating everyone equally and distributing across-the-board bonuses to large work units, the team is strengthened, but the individual link of pay-to-performance is weakened. What happens to those who contribute more? Less? While I know that CICCIP has mechanisms to award over-achievers, and that there remains a need for a satisfactory job rating before a bonus is paid, many of the employees with whom I spoke were unaware of these aspects of the program. They should be clarified and clearly communicated to the workforce.

My final recommendation is re-stated here for this summary, and deals with increased employee participation on the executive steering committee. One of the benefits of a gainsharing formula is that the bonus is calculated in an objective manner, based on a comparison of output to historical cost and volume levels. While many plans have failed due to an overly complicated formula, its objectivity also serves to maintain trust between management and employees. Under CICCIP, the executive steering committee has the final say regarding the degree to which a team has met their goals, and the resultant bonus payment, i.e., the committee takes the place of the formula.

Conflicts could arise in particular instances where the targets are not clearly defined, or where grey areas exist. This is certainly possible when using competitive benchmark data which many times is

uncertain or comes in only partial form. Having lower level employees participate in the executive committee would serve two purposes: First, it lends credibility to decisions regarding payout or conflict resolution -- particularly important in cases where a union is involved. And second, it sends the message that management is serious about employee participation. As stated earlier, the objective of participative management is not to turn the company into a democracy, but to involve employees so that they become 'owners' in the business. Management remains accountable, and must make the final decisions.

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