

A HYPOTHESIZED, GENERAL CAUSAL MODEL
OF A GAINSHARING PROGRAM

by

Paul Edward Rossler

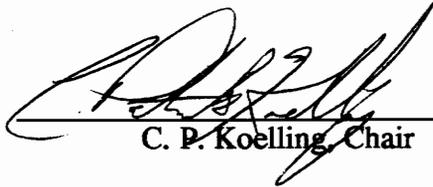
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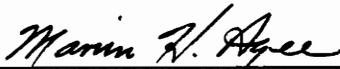
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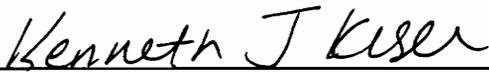

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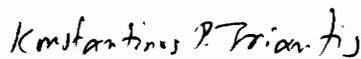
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Paul Edward Rossler

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Industrial and Systems Engineering

(ABSTRACT)

This research study investigated how gainsharing works to affect organizational performance. Six top managers at Commonwealth Paper (a pseudonym) described how they believe their gainsharing program works to affect company operations and performance. From their verbal descriptions, a site-specific causal model was created. This site-specific model was then compared to the gainsharing literature and a general model hypothesized. Future research studies could build on the research findings to enhance the quality of the general case model. Additional site-specific models and the enhanced general model could later be translated to a mathematical simulation model to see what might happen to a gainsharing program over time.

The research findings suggest that gainsharing works to affect organizational performance by providing additional forces for performance goal achievement. Gainsharing, however, does not provide a management practice or process through which performance goals are achieved. Because gainsharing can also provide forces for setting safe performance goals, it should be implemented in a culture where a critical mass of managers and workers are both intrinsically motivated and allowed to perform well.

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1.0. INTRODUCTION TO THE RESEARCH

This chapter provides an overview of this research study: 1) the statement of the problem and the research questions, 2) the historical context and background, 3) the research purpose and a general overview of how the research was accomplished, 4) the delimitations, 5) the underlying assumptions, and 6) the significance.

1.1 STATEMENT OF THE PROBLEM

To investigate how gainsharing works to improve organizational performance, the longitudinal case study, with repeated quantitative and qualitative measures of both predictors and criteria over several years, has been advocated as a useful research design (Schuster, 1984; Hammer, 1988; also see Campbell and Stanley, 1963).^{1,2} However, opportunities for gaining access to organizations for a period of several years, coupled with the difficulty and expense of conducting research in organizational settings, may limit the use of this research design (White, 1979). Where organizational access is possible, it is highly unlikely that, over time, the case study (and therefore, the research design) will proceed as planned (see Yin, 1984), thereby threatening validity of results. In addition,

¹Readers who are unfamiliar with gainsharing programs may wish to turn to Section 2.1 before continuing.

²A longitudinal case study differs from a cross-sectional case study in that the former explores, describes, or examines a phenomenon over several time periods whereas the latter explores, describes, or examines a phenomenon within a single time period. Most gainsharing case studies are cross-sectional, limited to the initial implementation period (typically one year, or at most two years).

managers and practitioners involved in the design of gainsharing programs do not have the luxury of time or the needed skills to conduct their own longitudinal, case study research on the effects of different gainsharing program policies. If a longitudinal case study is difficult to conduct, and its results unpractical and questionably valid, is there an alternative research design?

What if a longitudinal case study design could be conducted in a laboratory setting as an experiment? Controlled experiments in engineering are done with models (Forrester, 1975: 3). If one could translate managers' and staffs' verbal descriptions of how a gainsharing program is believed to work into a visual, causal model, and then translate this causal model into a mathematical model, then one could simulate gainsharing program behavior over time on a digital computer and conduct controlled experiments with various program policies. One engineering modeling methodology in particular, system dynamics modeling, not only provides the capability for a gainsharing design tool, but is well-suited to modeling the structures and behavioral phenomena found in organizational performance improvement programs (see Drew, 1989; Senge, 1990). Individuals and groups responsible for a gainsharing program's design and development could then ask "What if?" questions and experiment with new program policies.

A first step toward the development of a gainsharing design tool is the creation of a visual, causal model. This visual, causal model would show how a gainsharing program affects organizational performance variables and relationship. The broad question, therefore, addressed in this research was: How does a gainsharing program affect organizational performance? More specifically:

1. How does gainsharing work to affect organizational performance in one, specific organizational case?

2. Based on the answer to the above question and the gainsharing literature, how does a gainsharing program work, in general, to affect organizational performance?
3. What variables and relationships are found in the general hypothesized model that do not appear in the specific model?
4. What future research is suggested by the answers to Questions 2 and 3 to enhance our understanding and depiction of how gainsharing works to affect organizational performance?

1.2 HISTORY AND BACKGROUND

As the nature and organization of work have evolved over time, so have the nature and type of rewards (see Table 1-1). Although not widespread, the practice of sharing organization-wide productivity gains with employees dates back to the nineteenth century, with reward programs that were essentially group piece rate plans (Mitchell, Lewin, and Lawler, 1990). However, it was not until the 1930s, with the development of the Scanlon plan, that the modern form of gainsharing came into being — it coupled productivity sharing with employee participation (see Lesieur, 1958). Since that time, gainsharing has evolved from the well-known, traditional programs with suggestion systems and gains based on a single productivity measure (e.g. Scanlon, Rucker, and Improshare) to custom designed programs that incorporate multiple performance measures and self-managing work teams. Gainsharing has also expanded in application from small, manufacturing organizations to implementation in a wide variety of organizations, including

Table 1-1. A Summary of U.S. Human Resource Management Systems
(Source: Lawrence, 1985)

	Craft (dominant until 1820)	Market (dominant until WW I)	Technical (dominant until WW II)	Career (currently dominant)	Commitment (emerging)
Work Organization	Master/ journeyman/ apprentice work team	Unskilled machine operators organization into work gangs by foreman	Fine division of unskilled labor with machine pacing	Grouping of individual positions under a supervisor	Semi- autonomous work groups
Rewards	Rates set by individual contracts based on time	Pay by work performance (piece rate)	Hourly pay based on job evaluation	Salaries with multiple levels; raises by merit and seniority	Base salary with gain sharing

service organizations like banks, hotels, restaurants, and insurance companies (see Lawler, 1990). Today, the term “gainsharing” is used to describe a wide variety of reward programs that combine some type of employee involvement with a financial formula for distributing organization-wide performance gains (Bullock and Lawler, 1984).

Gainsharing programs are being touted by several leading management theorists as a necessary component of the reward system for the “commitment-oriented management practices” in the organization of the future (see, for example, Kanter, 1989; Walton, 1985).

While no one knows the exact number of U.S. companies using gainsharing, the interest in and use of gainsharing has increased tremendously during the 1980s. The General Accounting Office concluded in their 1981 study that gainsharing plans "warrant serious consideration by firms as a means of stimulating productivity performance, enhancing their competitive advantage, increasing monetary benefits to their employees, and reducing inflationary pressures" (the GAO's 1986 study reached a similar conclusion). A 1982 New York Stock Exchange study reported that gainsharing was one of the six fastest growing human resource activities in U.S. companies with 500 or more employees,

with a reported 15 percent of these companies using some form of gainsharing. More recently, a study sponsored by the American Productivity Center and American Compensation Association (O'Dell, 1987) found that 14 percent of the organizations surveyed had some form of gainsharing and that nearly 73 percent of the existing gainsharing systems had been implemented since 1980. The study also found that the number of companies planning to implement gainsharing in the near future will result in a 68 percent increase in the number of companies using gainsharing. More recently, a study by Lawler, Ledford, and Mohrman (1989) of the *Fortune 1000* found that 26 percent of those organizations used some form of gainsharing either on a limited or widespread basis.

Although gainsharing has never covered a large fraction of the workforce, it has always captured the interest and support of academicians (Mitchell, et al., 1990). Gainsharing has been viewed by academics as combining the best of economics, behavioral science, labor-management relations, and performance management practice. Lawler (1990), for example, called gainsharing an “organizational development technology.”

Despite academicians' interests in gainsharing, and the increasing number of gainsharing programs, the quality of gainsharing research has been less than desirable, leaving a number of key questions unanswered (Bullock and Lawler, 1984): What is the success rate and pattern of gainsharing programs? What gainsharing program or programs work best? When and where do gainsharing programs work? How are gainsharing programs integrated into the organization? Why do gainsharing programs work? *Perhaps the most important theoretical and empirical question is still, How does a gainsharing program affect organizational performance?* (see Hammer, 1988).

1.3 PURPOSE OF THE RESEARCH

The purpose of this research was to:

1. Create, based on interview data, a visual, causal model of gainsharing for a specific case (Commonwealth Paper, a pseudonym for the paper company at which this research was done). This site specific model depicts the variables, the cause and effect relationships, and feedback loops that six top managers believed represented how their gainsharing program works to affect company operations and performance. A long-term research objective — not to be accomplished here — is to use system dynamics modeling to translate the site-specific model to a mathematical simulation model .
2. Compare the site-specific model to the gainsharing literature to hypothesize a general case model. It depicts the variables, the linkages among these variables, and the feedback loops that, in general, determine how gainsharing programs work to affect company operations and performance. A long-term research objective — not to be accomplished here — is to use system dynamics modeling to translate this general case model to a mathematical simulation model.
3. Compare the variables and relationships identified in the general case model with the variables and relationships identified in the specific case model.
4. Discuss, based on the model comparisons, findings on how gainsharing works to affect organizational performance.
5. Present recommendations for future research designed to enhance our understanding and depiction of how gainsharing works to affect organizational performance.
6. Analyze and critique the research methodology.

Figure 1-1 depicts, in general, how the research purpose was accomplished (see Chapter Three for a detailed description). Six top managers at Commonwealth Paper described how they believe their gainsharing program works to affect company operations and performance. From their verbal descriptions, a site-specific causal model was created. This site-specific model was then compared to the gainsharing literature and a general model hypothesized. This site-specific model was then compared to the gainsharing literature and a general model hypothesized.

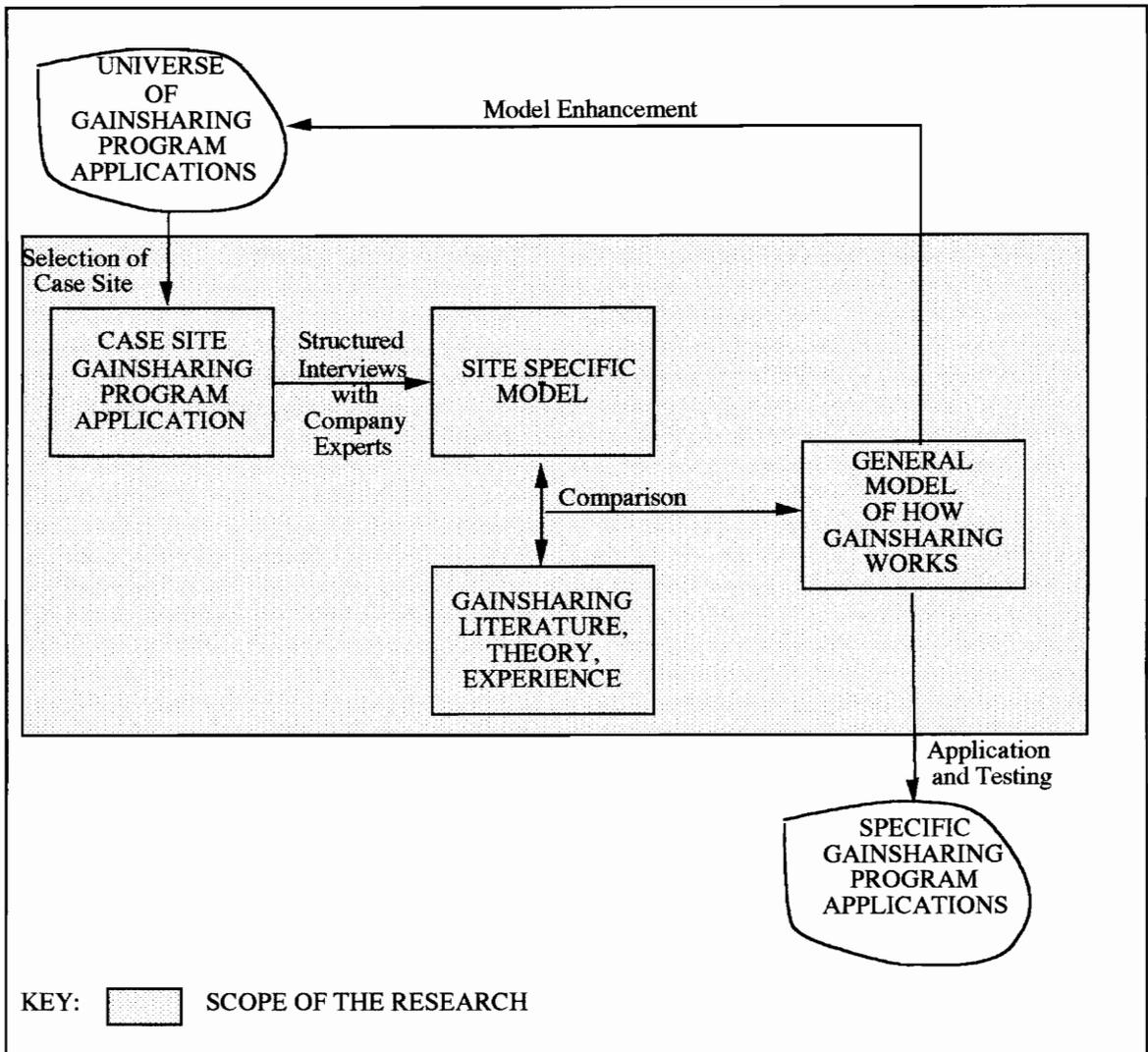


Figure 1-1. A Macro-level Process Flow Chart of the Research

Future research studies could build on the research findings to enhance the quality of the general case model.³ Additional site-specific models and the enhanced general model could later be translated to a mathematical simulation model to see what might happen to a gainsharing program over time.

1.4 DELIMITATIONS OF THE RESEARCH

To further define the research study and bound the investigation:

1. The study did not model, in either the site specific case or the general case, any systems or variables that have cause-and-effect relationships with exogenous variables.⁴
2. The study did not translate either the site specific or general model to a mathematical, simulation model.
3. The study did not employ experimental designs to explore and explain the relationship between model variables or sectors.
4. The study did not “perfect” the site specific model. Time constraints do not allow a validation of the site specific model using hard or soft prediction and criterion measures.

³If considered in the context of a larger research program, this research study is best characterized as exploratory, pilot research. The lessons learned in collecting, analyzing, and interpreting data for the single case site can be applied to collecting, analyzing, and interpreting data at other case sites. The site-specific model and the general case model will enhance both theory and the research methodology employed in subsequent studies.

⁴Exogenous variables are variables that are not affected by other variables inside the system. An endogenous variable is subject to the effects of other variables inside the system.

5. The study did not compare company experts' perceptions of important variables and cause-and-effect relationships. Because of differences among company experts in terms of organizational position, responsibility, and background; different perceptions of an organizational phenomena, like gainsharing, were present. Multiple perspectives are required to understand and accurately depict the phenomena of interest.
6. The study did not test the general, hypothesized model.

1.5 ASSUMPTIONS OF THE RESEARCH

Implicit in any research study are assumptions.⁵ The assumptions for this research were:

1. It is not possible to establish causality in any final and absolute sense when dealing with the complexities of real programs in which treatments and outcomes are never quite pure, single, and uncontaminated (Patton, 1986; Suchman, 1967). However, it is possible to arrive at some reasonable estimate that particular treatments have certain effects.
2. Because of differences among individuals in terms of organizational position, responsibility, and background; different perceptions of an organizational phenomenon, like gainsharing, will be present. Multiple perspectives are required to understand and accurately depict the phenomenon of interest.

⁵An assumption is a condition which is taken for granted and without which the research study would be impossible (Leedy, 1985). Stating assumptions helps the readers of the research and the researcher better understand and interpret the results.

3. The gainsharing literature and research, while criticized for its research quality (see Bullock and Lawler, 1984; White, 1979), is suitable for use in causal modeling (see Drew, 1989; Forrester, 1975: 3).⁶
5. Concepts that are presumed to be important, but do not have generally accepted definitions, can be given definitions and incorporated into the model.
6. Models of organizational systems like gainsharing should be directed toward policy (i.e. the few, major rules by which information sources are converted into decisions) (Forrester, 1975: 3).

1.6 SIGNIFICANCE OF THE RESEARCH

1.6.1 Need for the Research

Although gainsharing has been around since the late 1930s, it is still “a practice in search of profits and in need of theory” (Hammer, 1988). While the literature has ample descriptions of gainsharing programs, lists of causes and correlates of success and failure, and guidelines for initial design and implementation, little attention has been directed to understanding how gainsharing works to improve organizational performance.

The traditional approach to understanding the variables that affect organizational performance and improvement is best described as a “casual” approach (Drew, 1989), ranging from unsystematic, anecdotal, one-shot case studies to rigorous (but oftentimes trivial), quantitative, correlation-type studies (White, 1979). Anecdotal case study evidence, because of a lack of attention to validity issues, is suspect and of limited value. Correlation-type studies also have their shortcomings: the variables studied usually

⁶The gainsharing literature and research was not used to create the site-specific model. Rather, the site-specific model was compared to the literature in order to create the general case model.

represent small pieces of the overall system structure, and many different, even contradictory, models may each fit the observed data equally well (Drew, 1989). Perhaps the biggest shortcoming of all casual approaches is they are unable to provide an indication of what may happen if changes are made in the system. The traditional, correlational approach simply does not capture the full dynamics of the system, especially when feedback loops are present. Because feedback loops are the basic building blocks of systems (Forrester, 1975), they are found almost everywhere, especially in organizational settings.

All of the theoretical models of gainsharing developed to date are correlation-type models that are of little help in understanding the complexity of gainsharing programs over time. Understanding and delineating a causal model of how gainsharing works - one that captures its full, dynamic complexity - can provide an important conceptual model that program stakeholders could use in designing and evaluating their gainsharing experiments.⁷ At present, organizations either considering a gainsharing program or with a gainsharing program have no useful, causal model from which to tailor gainsharing theory for their specific situations. In addition, researchers have no comprehensive causal model to guide their investigation of gainsharing phenomena.

1.6.2 Benefits of the Research

The reason for conducting applied research on organizational systems is to contribute to the body of knowledge used by managers, practitioners, and researchers

⁷It is important to note that program stakeholders typically do not design experiments. The purpose of this research was not to convince managers and practitioners of the benefits of an experimental approach to gainsharing or provide them with the knowledge and skills to design experiments. Rather, the research simply attempted to define a general model of how gainsharing works and make this model available, through the literature, to program stakeholders who have adopted an experimental approach to gainsharing.

trying to understand and improve those systems. This contribution can expand the body of knowledge by uncovering new phenomena and relationships or can reinforce existing knowledge of phenomena and relationships. The results of this research will make a contribution to the field of compensation management in the area of reward system design — in particular gainsharing program design — and the field of performance management. It will also make a contribution to research methodology by providing both practitioners and researchers with a research method and a general causal model to guide their investigations of gainsharing phenomena.

The research results will be useful to organizations either considering or using a gainsharing program. For those organizations considering a gainsharing program, the research results will serve to communicate what a gainsharing program entails and reveal important program relationships. Organizations with existing gainsharing programs will benefit from the research results because the model developed will illustrate a critical first step of an experimental approach to improvement (i.e. defining how the program is believed to work — its “theory of action”) and could be used as a prototype for defining or evaluating their specific gainsharing program’s theory of action.

Finally, the research results will be of general use to researchers. Researchers can compare the data collected in this research with their research objectives and add to or adjust these results to help initiate or extend their own results. In addition, the model can guide research investigating questions such as: What is the difference between successful and unsuccessful gainsharing program applications? When and where do gainsharing programs work? How are gainsharing programs integrated into a organization? Why do gainsharing programs work? How do gainsharing programs work?

1.6.3 Limitations of the Research Results

There are three limitations to this research. First, the site-specific model may be of limited use to organizations that differ in some way from Commonwealth Paper.⁸ Morris (1975) points out that individual differences among organizations, among the people managing and working in them, and among opportunities to improve performance either through technology or through human resources, are significant. Therefore, the causal model an organization uses and tests should be based on the perceptions of its members (Patton, 1986: 7).

Second, the use of a single case provides a rather limited foundation for a general case model. The case site on which the general model is based was a non-random, purposeful, convenience sample.

Third, the research results will not be applicable to reward systems labeled as gainsharing, or considered gainsharing, but do not meet the definition of gainsharing as used in this study.

⁸See Chapter Four for a description of Commonwealth Paper.

2.0 THE REVIEW OF THE LITERATURE

This chapter reviews the gainsharing literature in order to determine what is known and not known in regard to the question being addressed in this research: How does a gainsharing program affect organizational performance? The literature review addresses: 1) gainsharing's role in the overall reward system, 2) causes and correlates of gainsharing program success, 3) the available theoretical frameworks and models of how gainsharing is believed to affect organizational performance, 4) system dynamics modeling— the modeling technique used in this research, and 5) the meaning of improvement program design and experimentation in organizational settings.

2.1 GAINSHARING AS A COMPONENT OF THE REWARD SYSTEM

The reward system is all rewards and incentives, both direct and indirect financial, that an organization provides or offers its members for their value-added and performance contributions.¹ The reward system should attract and retain individuals with the knowledge, skills, and abilities an organization needs to provide its products and services; should focus organizational members' efforts on the right things; and should compensate organizational members fairly for value-added contributions and service (see Henderson,

¹This definition of the reward system is somewhat narrow. There is a non-financial or social-psychological reward system also operating in an organizational setting. This social-psychological reward system is comprised of components such as job characteristics, culture, the quality of management, social and professional relationships, performance feedback, organizational and group objectives, opportunity, power, and involvement (see Barnard, 1938). These components may influence an individual's contributions to an organization to a greater degree than the financial reward system.

1989; Milkovich and Newman, 1987). Because the reward system can influence individual and group performance and contribute to (or lessen) a sense of organizational commitment and ownership, it is a significant economic cost to organizations and social-psychological cost to individuals. It is systemic, pervading almost every facet of organizational life and is a key management system that cannot be ignored in organization-wide efforts to improve performance (see Kilmann, 1989; Lawler, 1981).

The various component subsystems of the reward system can be categorized according to three major dimensions — form (direct financial, indirect financial), basis (value-added contribution, performance contribution), and unit of analysis (individual, group, organizational) — in addition to various subdimensions — for example, horizon (short-term, long-term), frequency (immediate-deferred; regular-intermittent), flexibility (fixed, variable), customer served (management, non-supervisory), distributive principle employed (need, equality, equity), and push-pull (standards based, goals based).² Figure 2-1 on page 18 shows the framework for depicting the various component subsystems of the reward system and identifies their primary differences.

An increasing number of organizations have found that their reward system does not support the behaviors and performance levels required for organizational improvement and success (see Kerr, 1975). This has led to an increased interest in, and implementation of, alternative reward system designs, and hence, new reward system improvement programs (see Mitchell, et al., 1990; O'Dell and McAdams, 1987). The component

²These subdimensions could be considered design features of these component subsystems. For example, the design of a component system classified as direct financial, individual level, and performance based may differ in terms of time horizon, frequency, and customer served from one application to another.

subsystems which generally comprise these reward system improvement programs are (Lawler, Ledford, and Mohrman, 1989; O'Dell and McAdams, 1987):³

1. Merit Pay (Cell 1,2,1)⁴ - a pay system that allocates pay increases based upon individual performance (Lawler, 1991).
2. Profit Sharing (Cell 2,2,1; occasionally Cell 2,2,2) - a pay system that bases an annual bonus or share of profits on company or corporate profit performance; this annual bonus can be paid in cash or deferred into a retirement fund (see O'Dell and McAdams, 1987).
3. Gainsharing (Cell 2,2,1; occasionally Cell 2,2,2) - a pay system which combines some type of employee involvement with a weekly, monthly, or quarterly cash bonus based on a financial formula for distributing organization-wide performance gains (see Bullock and Lawler, 1984).
4. Stock Ownership (Cell 2,1,1) - an organizational arrangement where there remains a clear separation between managers and workers, where shares of ownership are not necessarily distributed equally, and where a

³Depending on specific design features, these component subsystems may fall in more than one cell of the taxonomy. One example of this is benefits. While most benefits are in-kind payments (making them indirect financial), other benefits - such as unemployment compensation, disability income continuation - are direct financial. Another example of this is recognition. Some recognition programs offer direct financial rewards such as cash; others provide indirect financial awards such as merchandise. Another example is merit pay and lump-sum bonuses. Where merit pay or the lump-sum bonus is based on individual performance, it would be classified as performance contribution-based. However, it is not uncommon for merit pay raises and lump-sum bonuses to be distributed equally to everyone, regardless of their individual performance. Where this occurs, merit pay and lump-sum bonus programs would be categorized as value-added, group-based rewards.

⁴Component subsystems are positioned in the framework shown in Figure 2-1 by a cell number. The first position in the cell number is the unit of analysis (1 for individual, 2 for group), the second position is contribution (1 for value-added, 2 for performance), and the third is form (1 for direct financial, 2 for indirect financial).

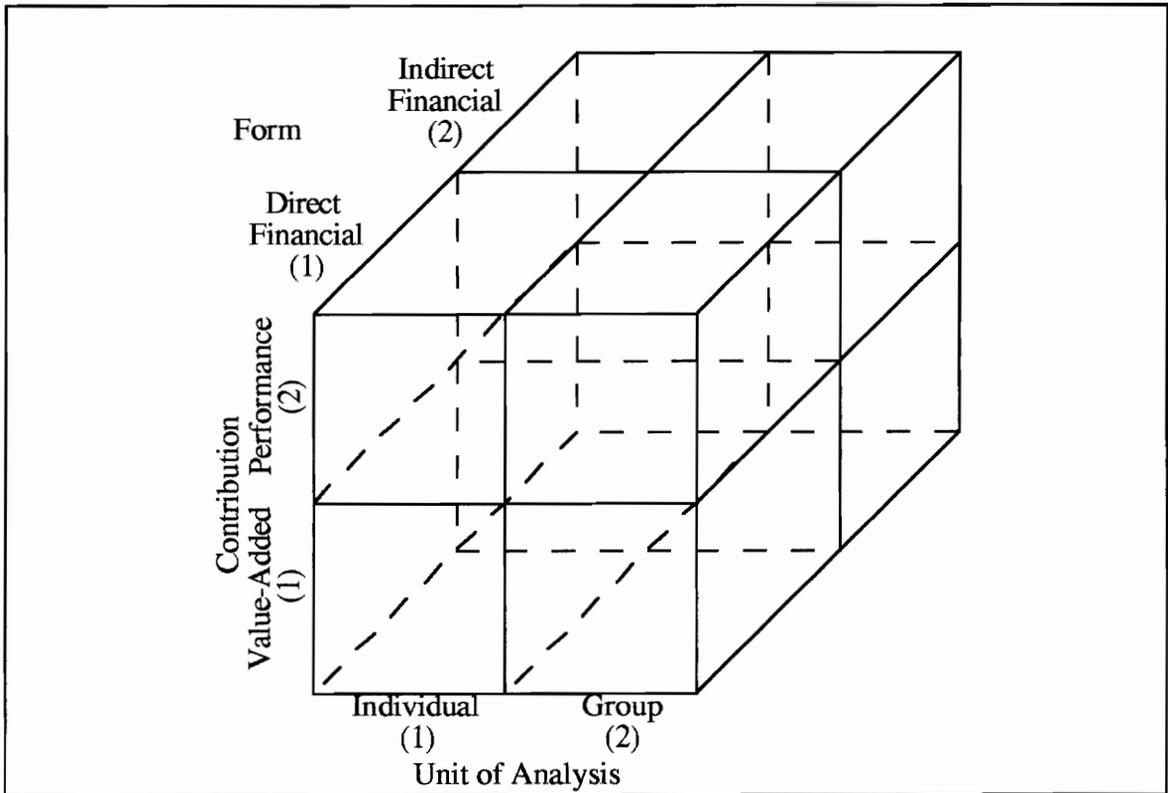


Figure 2-1. A Framework for Classifying Reward System Components

- significant portion of the people who work in the firm possess ownership in the employing organization (Pierce, Rubinfeld, and Morgan, 1991).
5. Knowledge/Skill-Based Pay (Cell 1,1,1) - a pay system in which base pay is determined by the job skills mastered by an individual (see Lawler, 1990).
 6. Flexible or “Cafeteria” Benefits (Cell 1,1,2) - a pay system in which individuals decide how their benefit dollars are spent.
 7. Employment Security (2,1,2) - a policy and supporting tactics that increase the stability of the workforce (Grayson and O’Dell, 1988).
 8. Recognition (Cell 1,2,2) - a policy and supporting tactics that formally acknowledge individual or group performance

9. Lump-sum bonuses (Cell 1,2,1) - a pay system which is similar to merit pay, with the exception that pay increases are distributed in a lump-sum amount instead of being rolled into base pay.
10. Small-group bonuses (Cell 2,2,1) - a pay system similar to gainsharing with the exception that the unit of analysis for measurement is at the group-level, rather than at the organizational-level.

Table A-1 in Appendix A, pages 233 to 238 presents a comparison of better known gainsharing programs along a number of dimensions. It is important to note that the actual design of a particular program may or may not look the same within or along all dimensions depending on the specific application.

2.2 CAUSES AND CORRELATES OF SUCCESS

Table A-2 in Appendix A, pages 239 to 249, provides summaries of case studies, books, empirical studies, and review, integrative, theoretical studies found in the gainsharing literature. All literature prior to and including 1978 was reviewed by White (1979) for the purpose of generating hypotheses regarding correlates and causes of gainsharing program success; this review extends White's review from 1979 to the present.⁵

A review of Table A-2 revealed that there is a lack of theory-driven, systematic investigations and relatively weak case study or empirical evidence supporting the

⁵White (1979) used the term Scanlon plan instead of gainsharing. While the Scanlon plan is a type of gainsharing program, prior to 1979 it could be equated with gainsharing in general. The vast majority of gainsharing program applications prior to 1979 that were documented in the literature were Scanlon plans. Because consultants hold the copyrights to Rucker and Improshare plan applications, they have not received much attention in the literature. Custom approaches, like family of measures, are second generation gainsharing programs and have just started to receive attention in the literature.

commonly identified causes and correlates of gainsharing program success in books and in review, integrative, and theoretical studies (see Table A-3 in Appendix A, pages 250 to 252). A content analysis of case study findings and empirical study findings revealed nine categories of causes and correlates of success. Categorizing the causes and correlates of success proved to be a difficult and frustrating task due to the lack of operational definitions of concepts in the gainsharing literature. Below are the nine categories and the concepts grouped under each one:

1. Values, Beliefs, Attitudes, Agendas - non-action or pre-action-oriented concepts such as willingness, confidence, expectations, commitment, and acceptance.
2. Management Practices - action-oriented concepts like leadership, involvement, sanction, competence, and support.
3. Participative Management or Involvement Practices - the form or type of participation and involvement (e.g. suggestion system, group-based, staff involvement).
4. Performance Measurements - the validity, reliability, complexity, accuracy, acceptance, and understanding of performance measurements.
5. Information Sharing, Feedback - the timeliness, credibility, usefulness, and frequency of information sharing and performance feedback.
6. Bonus Payments - the frequency of, regularity of, size of, and equity associated with bonus payments.
7. Program Support - individuals, groups, functions, or activities that support the gainsharing program (e.g. education and training, consultant, gainsharing coordinator, monitoring).
8. Organizational Characteristics - process, product, structure, markets, size.

9. Workforce Characteristics - attributes of program participants (e.g. skills, experience, level of job involvement).

The lack of a clearly defined set of causes and correlates of success may be due to the fact that much of the gainsharing literature is not theory-based and is mostly comprised of unsystematic studies. Lack of theory and systematic research may be due to the fact that most of the gainsharing experience is largely in the hands of a small group of consultants, or academicians acting as consultants; design and implementation of the client's gainsharing program is primary, and theory and research development secondary. In addition, the researcher, acting as consultant, will often find it difficult, if not impossible, to publish failures or negative findings when the client is paying for the services or research.

The lack of a theory-based literature, the presence of unsystematic studies, and the lack of theoretical models, does not make the gainsharing literature useless. As White (1979) points out, "this is the only literature available." Forrester (1975), Drew (1989), and Senge (1990) have found that valid, causal models can be constructed from non-theory-based, unsystematic descriptions of how a system is believed to work.

2.3 AVAILABLE FRAMEWORKS AND MODELS OF HOW GAINSHARING IS BELIEVED TO WORK

2.3.1 Theoretical Frameworks

Despite the lack of strong evidence, several researchers have provided frameworks for understanding the structures and processes associated with gainsharing program design, implementation, and ongoing development. For example, White's (1979) framework is nothing more than a grouping of variables which he identified in the literature as related to gainsharing program success: (1) situational factors (size, technology, and managerial climate); (2) personnel characteristics (the attitude of the CEO, management, and foreman; background characteristics of the workforce such as experience, skill, tenure, sex, importance of work; and expectations of success and failure before the gainsharing program is begun); and (3) process variables (number of years a company has had the program, the extent to which feedback on performance is given to the employees promptly and in a usable form, the extent to which too much emphasis is placed on the bonus and not enough on the nonfinancial aspects of the plan). While White used these variables to develop and test a set of hypotheses relating to gainsharing program success, they could be used to construct a rudimentary, correlation-type model of gainsharing. It appears that this was done five years later by Bullock and Lawler (1984).

Bullock and Lawler (1984) developed the model shown in Figure 2-2 in order to analyze the case study literature on gainsharing programs. The model, which is intended more as a device for cataloging existing information rather than a model of how gainsharing works, predicts gainsharing program success from the effect of structural factors (what is done), implementation factors (how it is done), and situational factors (where it is done). The researchers conclude that longitudinal studies of the fundamental issues common to all

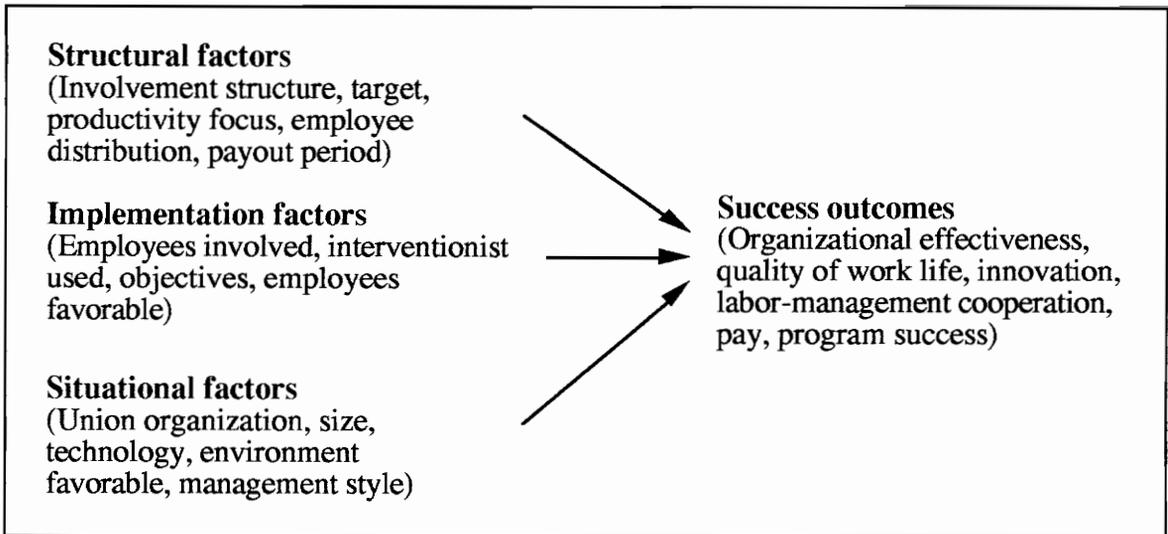


Figure 2-2. Bullock and Lawler's (1984) Heuristic Model of Gainsharing

gainsharing programs are needed to understand the in-depth dynamics of gainsharing, and that comparative studies are needed to integrate patterns across gainsharing cases in order to understand how structures and processes affect results.

The most comprehensive theoretical framework developed to date is that of Graham-Moore and Ross (1983). The Graham-Moore and Ross framework, depicted in Figure 2-3, was based on their review of "the current research on productivity and reward systems" and their "best judgment," derived from their consulting experience, as to which variables are perceived to be relevant. The box in Figure 2-3 represents an organization as it moves through time; the letters A, B, C, and D represent the relevant, macro-level variables that influence a gainsharing program's initial implementation, ongoing development, and institutionalization.

The letter A represents organizational variables; it is placed inside the box in Figure 2-3 because these variables are typically within the control and influence of the organization itself:

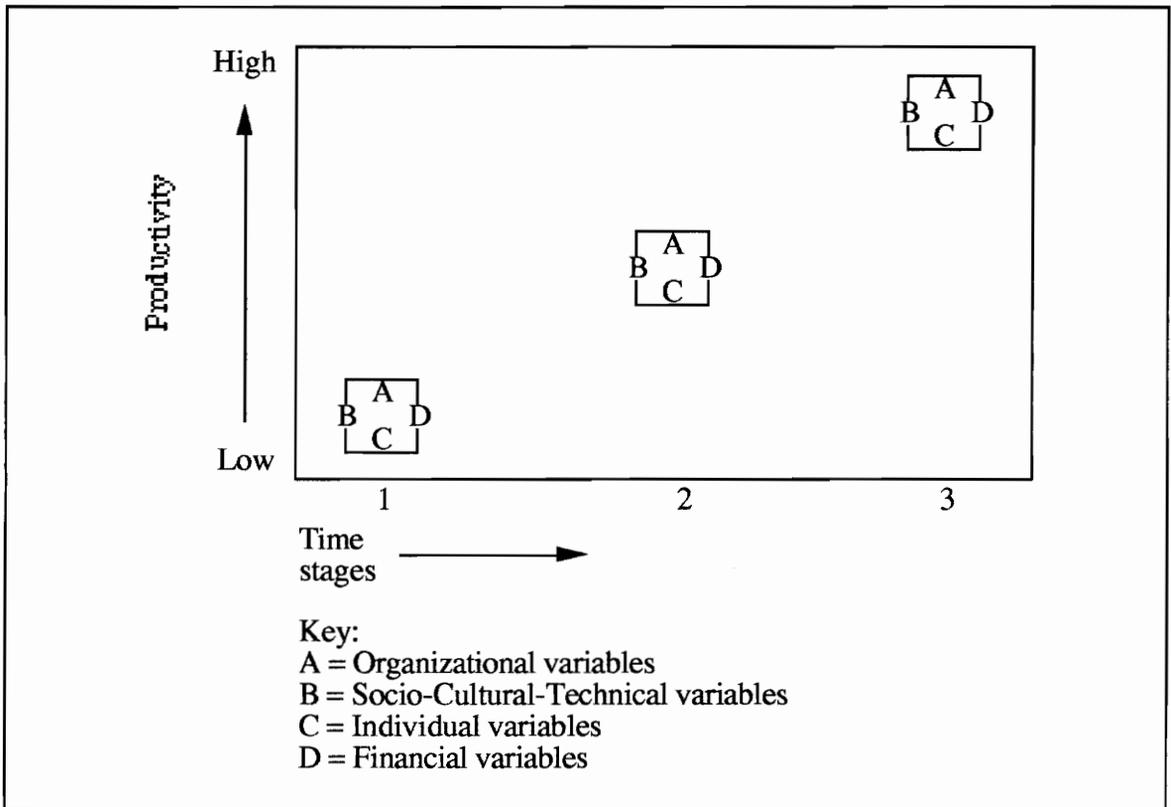


Figure 2-3. The Graham-Moore (1983) Framework
 Depicting the Context Surrounding the Gainsharing Model

- (A1) Climate: the perceptions and attitudes toward immediate supervision, work groups, management, and the abstract organization.
- (A2) Size: the influence of the number of employees allowed in work groups.
- (A3) Technology: the interface between human resources and the technical requirements of work, from machine-paced work to the know-how required.
- (A4) Policy: the stated and implied rules or procedures that guide and constrain action.
- (A5) Reward structure: the formal and informal system for reinforcing behavior valued by the organization, including its recent cumulative reward history.

(A6) Identity: the merging of individual goals and needs with those of the organization into a congruent pattern of attitudes, beliefs, and actions.

The letter B represents the socio-cultural-institutional variables that influence a gainsharing program. B is placed on the boundary of the box in Figure 2-3 because many of these variables are not under the direct control of the organization. The B subvariables are:

- (B1) Union and industrial relations: the degree to which one places the organization on a continuum of adversarial/harmonious relations existing between the firm and bargaining units.
- (B2) Workforce characteristics: the demographic and cultural profile of work groups, supervisors, and managers, especially their attitudes and values toward work in general.
- (B3) External environment: the relevant exogenous variables that have a long-range impact on the firm, such as geography, labor market, housing, and schools.

The letter C indicates all the individual-level variables that affect a gainsharing program. The C subvariables are:

- (C1) Managerial philosophy: beliefs about how people are to be controlled and how this control is to be communicated.
- (C2) Trust: one's degree of confidence in the honesty, goodness, and fairness of others.
- (C3) Locus of control: degree to which an individual perceives his or her behavior can influence rewards.
- (C4) Skill level: the ability of an individual to get results from data, people, or materials.

(C5) Motivation: the amount of force or energy an individual expends in a controlled, directed manner.

(C6) Satisfaction: the degree of contentment and gratification that stems from the job intrinsically or is derived from the job extrinsically.

The last macro, theoretical variable is D, representing the financial variables. These variables, like B variables, lie on the boundary of the organization. The D subvariables are:

(D1) Internal system attributes: accuracy, utilization, and control of inventory; production; budgets; and standards.

(D2) External system attributes: knowledge of competition, markets, pricing, economic factors, and governmental constraints.

Graham-Moore and Ross state that while all four of these macrovariables influence a gainsharing program, they interact with each other in ways that are not fully understood. In addition, the particular emphasis given these variables changes depending on a particular organization's characteristics and situation; a gainsharing program design team could use this framework to determine the degree of fit between a particular program design and the organization. They conclude that management must understand, as fully as possible, how each of these variables influence a gainsharing program alone and in concert.

2.3.2 Correlation-Type Models of Gainsharing

There are two correlation-type models that depict some of the key variables and relationships operating in gainsharing programs: Florkowski's (1987) model and Hammer's (1988) model. A description of each follows.

2.3.2.1 Florkowski's model of profit sharing. Florkowski, after an extensive review of the literature, developed the model shown in Figure 2-4 in order to

foster improved research on profit sharing programs.⁶ Although the model is not gainsharing specific, and is deeply rooted in a psychological view of organizational behavior, it does highlight some of the key variables and relationships which, more than likely, operate in a gainsharing program.

Profit sharing begins with an initial stimulus for change, such as the desire or need to increase productivity or tie labor costs to the organization's economic condition (Block 1 in Figure 2-4). Individually or collectively, these motives lead to the structural design and implementation of profit sharing (Block 2).

Features of the profit sharing program (Block 2) determine the program's psychological impact. Participation in the program (Block 2) should influence the perceived importance of the plan; that is, as the number of organizational members and organizational levels included in the program increases, the perceived importance of the program will increase. The size of the profit-based incentive (Block 2) should affect perceptions of pay equity among participants (Block 3). The distribution schedule, along with the organizational units or subunits used to assess profitability (Block 2), should influence perceptions of performance/reward contingencies (Block 3). Last, the quality of participation designed into the program (Block 2) is expected to affect organizational members' perceived influence on decision making (Block 3).

Perceptions about the importance of the plan, pay equity, performance/reward contingencies, and influence on decision making (Block 3) are expected to influence executive, supervisor, employee, and union support for the profit sharing program (Blocks 5, 6, 7, and 8). Executive support for the profit sharing program also should be influenced

⁶The description of this model draws heavily from Florkowski (1987). Profit sharing is used in the text instead of gainsharing to remind the reader of the model's original intent.

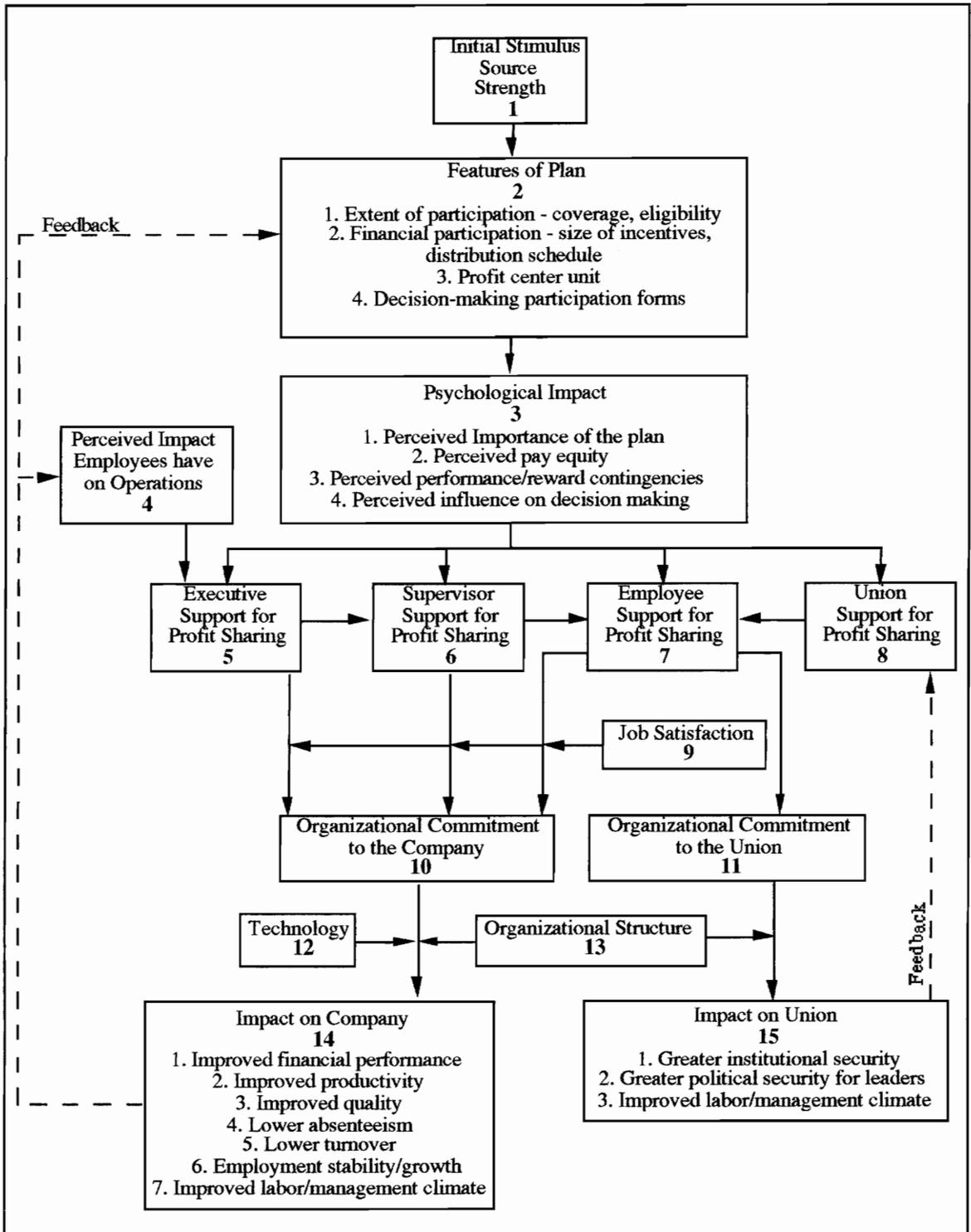


Figure 2-4. Florkowski's (1987) Model of How Profit Sharing Works to Improve Performance

by their perceptions of the affect that employees have on operations (Block 4).

Supervisors' and employees' support for the program (Blocks 6 and 7) should be responsive to the perceived backing that profit sharing receives from executives; in turn, supervisors' support for the plan should increase employees' support. Union support for the profit sharing program (Block 8) is also expected to influence employees' support.

As support for the profit sharing program increases, so should the level of executives', supervisors', and employees' commitment to the organization (Block 10); the current level of job satisfaction (Block 9) influences the relationship between support for the profit sharing program and organizational commitment. In unionized settings, employee support for the profit sharing program (Block 7) also should raise organizational commitment to the union (Block 11) among bargaining unit members.

Increased commitment to the organization and union should result in performance improvement in the areas of financial performance, productivity, quality, absenteeism and turnover, employment stability and growth, and an improved labor-management climate (Block 14). The union may experience greater institutional security, greater political security for its leaders, and improved labor-management relations (Block 15). The extent to which greater organizational commitment will manifest itself in observable gains should be moderated by two variables, technology (Block 12) and organizational structure (Block 13).

Last, the model posits that the company and the union will use their assessments of profit sharing's impact as feedback to guide future actions regarding the profit sharing program. For example, the company is expected to alter the program's structural features (Block 2) to enhance program performance. Executive perceptions of the impact employees have on operations (Block 4) should be affected by the programs influence on organizational performance. The union should continue its support for the profit sharing

program (Block 8) if there are signs that employees believe the union has helped secure greater benefits via the program.

2.3.2.2 Hammer's model of gainsharing. Hammer's model, depicted in Figure 2-5, shows how the bonus payment component and the employee involvement component of gainsharing work together to improve productivity.⁷ The bonus payment occurs twice in the model: first as a promise of equity in a redefined work-effort bargain between the organization and its members that serves to secure initial acceptance of the gainsharing program; and second, as actual payments to members following organizational productivity gains. Participation — direct worker involvement in and influence over work processes and performance issues — leads to three outcomes. The first outcome is the identification of and solution to productivity problems, and identification and acceptance of performance improvement goals. From the problem-solving and goal-setting activities follow (1) improvements in the planning and organization of the work, including the removal inefficiencies from the production process, and (2) increased effort — physical, mental, or both — toward the attainment of the productivity and cost-containment goals.

The second outcome of participation — which, according to Hammer, has a more nebulous status in the model — is intrinsic motivation. If one accepts the hypothesis that involvement in and influence over organizational decision making is intrinsically motivating, organizational members will be more motivated to participate, but they will not necessarily be more motivated to do the work they are supposed to do. Therefore, the model has a feedback loop from intrinsic motivation back to participation, but not a direct causal arrow from participation to an intrinsic motivation to engage in other forms of work.

⁷The description of this model draws heavily from Hammer (1988). The words productivity and performance are used interchangeably in this description because Hammer never operationally defines these terms. An assumption is made that these terms, when used in regard to Hammer's model, mean the same thing. This loose usage of terms will be corrected during the model development stage of this research.

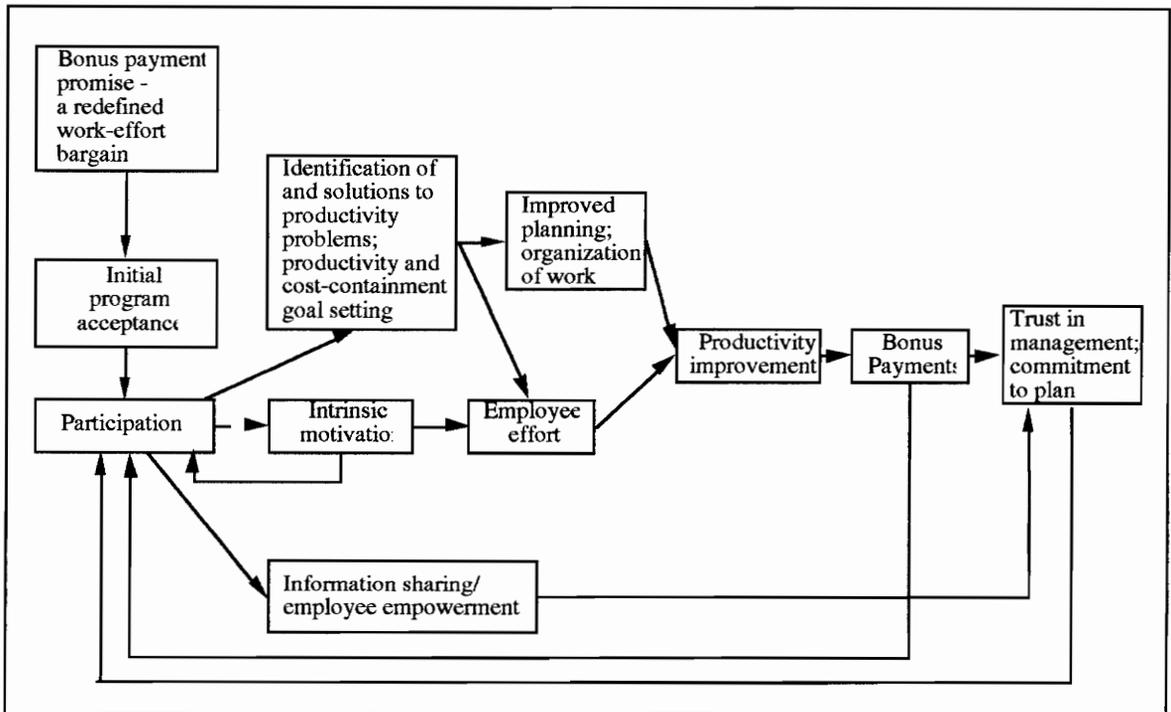


Figure 2-5. Hammer's (1988) Model of How Gainsharing Works to Improve Performance

The third outcome of participation is the empowerment of lower level employees through their access to management-level information. Effective participation creates pressure on management to open communication and share information. Information is a source of power in organizations and extensive information sharing decreases traditional labor-management power gaps (Lawler, 1986).

Improved planning and organization of work, together with increased member effort, result in productivity improvements, which are translated into bonus payments through some financial formula. Trust in management and commitment to gainsharing are further strengthened by the bonus payments. The monetary gains, and employee trust and commitment, reinforce participation.

2.3.3 Caveats Left by the Available Models

Correlation-type models, like those of Florkowski (1987) and Hammer (1988), and the theoretical frameworks of White (1979), Bullock and Lawler (1984), and Graham-Moore and Ross (1983), usually represent small pieces of the overall system structure (see Drew, 1989). Perhaps the biggest shortcoming of all correlational approaches is that they are unable to provide an indication of what may happen if changes are made in the system. The traditional, correlational approach simply does not capture the full dynamics of the system, especially when feedback loops are present. Because feedback loops are the basic building blocks of systems (Forrester, 1975), feedback loops are found almost everywhere, especially in organizational settings. System dynamics modeling allows one to develop a causal model that reflects the full, dynamic complexity.

2.4 SYSTEM DYNAMICS MODELING

Table 2-1 compares the assumptions underlying the traditional, correlational approach to studying organizational systems with the assumptions underlying system dynamics modeling. A system dynamics model starts with a verbal description or mental model of the system expressed in words and is then translated into a visual, causal diagram, from which the system equations are written.⁸ The model is exposed to criticism, revised, exposed again, and so on in an iterative process that continues as long as it is useful.

⁸This section is based almost entirely on Drew's (1989) description of system dynamics modeling.

Table 2-1. A Comparison of the Major Assumptions Underlying Two Different Approaches to the Study of Organizational Systems (Source: Forrester, 1975: 3)

<i>Major Assumptions of the Traditional, Correlational Approach</i>	<i>Major Assumptions of the Causal, System Dynamics Approach</i>
Linearity is an adequate representation of organizational system behavior.	Much of the important behavior of organizational systems is a direct manifestation of nonlinear characteristics.
Organizational systems are inherently stable.	Many organizational systems are characterized by an unstable, nonlinear, self-limiting systems behavior.
The purpose and test of a model of an organizational system is to predict specific future action.	A model should be used to predict the character and nature of a system and for the design of the kind of system desired.
The construction of the model must be limited to those variables for which numerical time series data exists.	A model of system behavior must deal with those variables which are thought to control system action.
A model must be limited to those variables which have generally accepted definitions.	Undefined concepts that are presumed to be of major importance must be given definitions and included in the model.
The vast body of descriptive knowledge in the business press is unsuitable for use in model formulation.	The popular business press may contain the clearest and most perceptive published insights to the reasons for managers' decisions.
Exactness and accuracy must be measured in terms of the number of decimal places. There is a sharp distinction between the "exact" and the social sciences.	Exactness and accuracy must be measured in terms of requirements. Dynamics of system behavior can be studied using parameters which may be in error by a factor of three.
The physical sciences provide the proper analogy for model building in the social sciences.	Engineering models of telephone systems and aircraft controls, and military models of military systems and missile controls provide a much better analogy.
Accuracy of parameters is more important than accuracy system structure.	Accuracy of system structure is more important than accuracy of parameters. Correct parameters can hardly succeed in a grossly incorrect model structure.

Table 2-1. Continued

<i>Major Assumptions of the Traditional, Correlational Approach</i>	<i>Major Assumptions of the Causal, System Dynamics Approach</i>
Accuracy must be achieved before precision is useful.	A precise and explicit statement with assumed numerical values can be tremendously revealing.
It is necessary to find optimal solutions to managerial questions.	Optimal solutions are generally possible only for simple questions.
The social sciences differ from the physical sciences by inability to conduct "controlled experiments."	Controlled experiments can be done with models.
Human decision making is obscurely subtle and impenetrable.	The major factors to which a decision is responsive are relatively few in number and are usually subject to clarification if properly approached.
The emphasis on models of organizational systems should be on decision making.	Models of organizational systems should be directed toward policy, the rules by which information sources are converted into a continuous flow of decisions.

To translate a verbal description into a causal model requires an understanding of four hierarchical different levels of feedback system structure: variable, linkage, feedback loop, and feedback system (Roberts, 1978). A variable is a quantity that varies over time. There are two types of variables: level and rate. A level variable, at any moment in time, describes the condition or state of the system, and provide the information on which the rate variables are based. An example of a level variable for a factory is inventory; for a city, population; for a bank, balance. Rate variables cause and control changes in the level variables; they are the policy statements of a system.⁹ Examples of rate variables for

⁹As Forrester (1975: 8) points out, level and rates concepts are found in many fields. In economics, the levels are often referred to as stocks and the rates as flows or activities. In business, the balance sheet gives the present financial condition or state of the system (i.e. the level variables) as it has been created by accumulating or integrating past rates of flow (i.e. the profit and loss variables). In social-psychology, the concept of field or life space corresponds to the level variables and behavior corresponds to the rate variables. In

inventory in a factory are production (a rate-in) and sales (a rate-out); for population in a city, births (again, a rate-in) and deaths (a rate-out); for a bank balance, deposits (a rate-in) and withdrawals (a rate-out).

A linkage is a cause-and-effect relationship between two variables.¹⁰ Each linkage can be represented by an arrow, with the direction of the arrow indicating the direction of causation, and a plus or minus directional sign placed near the arrow head indicating the polarity of the relationship. A plus relationship means that the dependent variable (the variable at the arrow head) changes in the same direction as the independent variable (the variable at the arrow tail); a minus relationship means that the dependent variable changes in the opposite direction as the independent variable. Linkages can also be one of two types: physical and informational. The causal relationship between a rate variable such as a production rate (widgets/hour) and a level variable such as inventory (widgets), is a “physical flow.” However, the relationship between the level variable (inventory) and the rate variable (production rate) is an “information flow”; information regarding the state of inventory influences the production rate. In the context of causal diagramming, physical flows can be represented by solid arrows, and informational flows, which emanate from level variables, can be represented by dashed arrows. Using this convention, rate variables will always be found at the tail of a solid arrow and level variables will be found at the head of a solid arrow.

The linkage between a level variable, L , at time t , and a rate variable R can be expressed in the integral equation (Drew, 1989)

$$L(t) = L(t-1) + R dt$$

or in the equivalent difference equation

engineering feedback systems, the state variable approach conveys the same ideas that are associated with the level variables.

¹⁰Implicit in any causal relationship is the provision “all other things being equal.”

$$L(t) = L(t-1) + (dt)R(t-1, t)$$

Because in most situations, a level variable will be affected by a rate-out as well as a rate-in, the single rate equations above are easily generalized to take this into consideration (Drew, 1989):

$$L(t) = L(t-1) + (RI-RO) dt$$

$$L(t) = L(t-1) + (dt)[RI(t-1,t) - RO(t-1,t)]$$

In difference equation terminology any level variable, L_i , can be expressed as functions of rate variables, R_j , and the previous value of the level (Drew, 1989):

$$L_i(t) = L_i(t-1) + (dt) \sum R_j(t-1) \text{ where } i=1\dots m$$

with the R_j 's assumed to be constant over the interval from $t-dt$ to t . The rate variables are in the form:

$$R_j(t) = f[L_i(t), E_k(t), A_{ij}(t), A_{kj}(t)]$$

where E_k are the set of exogenous inputs that affect R_j directly and A_{ij} and A_{kj} are the impacts or auxiliary variables in the causal streams from the i th level variable and k th exogenous input directly.¹¹ Since the exogenous inputs are known time functions or constants, if the initial values of the level variables are known, all other variables can be computed from them at that time. Then the new values of the level variables can be found from the level equation. This integration (or accumulation) can be applied to level and rate structure found in feedback loops.

A feedback loop consists of two or more linkages connected in such a way that, beginning with any variable, one can follow the arrows around the structure and return to the starting variable. Within a feedback loop, a change in one variable ripples through the entire chain of variables forming the loop, until the initial cause becomes an indirect affect

¹¹Exogenous variables are variables which are not affected by other variables inside the system. A variable that is subject to the effects of other variables inside the system is termed "endogenous."

on itself. Just as linkages have two possible polarities, feedback loops have two possible polarities, positive or negative. Positive feedback loops contribute to either persistent growth or continuous decline of level variables; positive feedback loops are often referred to as virtuous or vicious cycles, depending on the intended or unintended system behavior. Negative feedback loops modify the rates of flow variables to bring level variables back to their desired values, much like a thermostat controls the temperature in a room. In other words, a positive feedback loop acts to reinforce level variable changes in the same direction as the change, and a negative feedback loop acts to resist or counter level variable changes, thereby pushing toward a direction opposite a change, contributing to fluctuation or to maintaining the equilibrium of the loop. A simple way to determine the polarity of a feedback loop is to count the number of negative linkages: if even, the feedback loop is positive; if odd, the feedback loop is negative.

A feedback system arises when there is one or more connected feedback loops. The order of the feedback system is determined by the feedback loop with the maximum number of level variables in the loop. The behavior of the level and rate variables in each feedback loop can be propagated through their connection to other variables in other loops within the feedback system. Social systems, organizational improvement programs included, belong to a class of information-feedback systems called “multi-loop, non-linear feedback systems” (Forrester, 1975: 14). Because multi-loop, non-linear feedback systems result in complex system behavior, they do not lend themselves to intuitive or casual analysis. In fact, equations describing multi-loop feedback systems cannot be solved using ordinary mathematical approaches, making it necessary to use simulation.

System dynamics modeling, with its simulation capabilities, may prove useful to managers and practitioners responsible for gainsharing program design. System dynamics

would provide these managers and practitioners with a tool to conduct controlled laboratory experiments on a gainsharing program.

2.5 GAINSHARING PROGRAM DESIGN AND EXPERIMENTATION

Kurstedt's (1991) conceptualization of a management system provides a useful starting point for depicting the theoretical framework for experimentation in organizational settings (Figure 2-6). According to Kurstedt, a management system has three components — who manages, what is managed, and what is used to manage — and three interfaces: decision/action, measurement/data, and information portrayal/perception. “Who manages” is any individual in an organizational setting who uses information to make decisions that result in actions that affect what is managed. “What is managed” includes the physical things that are managed. “What is used to manage” are the management tools. “Who manages” makes decisions based on information that is useful. Converting information to action is the crux of the decision/action interface (i.e. management). Through measurements to assess performance, data are generated which represent characteristics of what is managed (the measurement/data interface). Information results from biasing and portraying data to who manages; “who manages” perceives information based on her or his individual characteristics (the information portrayal/perception interface).

Because Kurstedt's model was intended primarily for the design and improvement of management tools (what is used to manage) for individuals (who manages), it is not

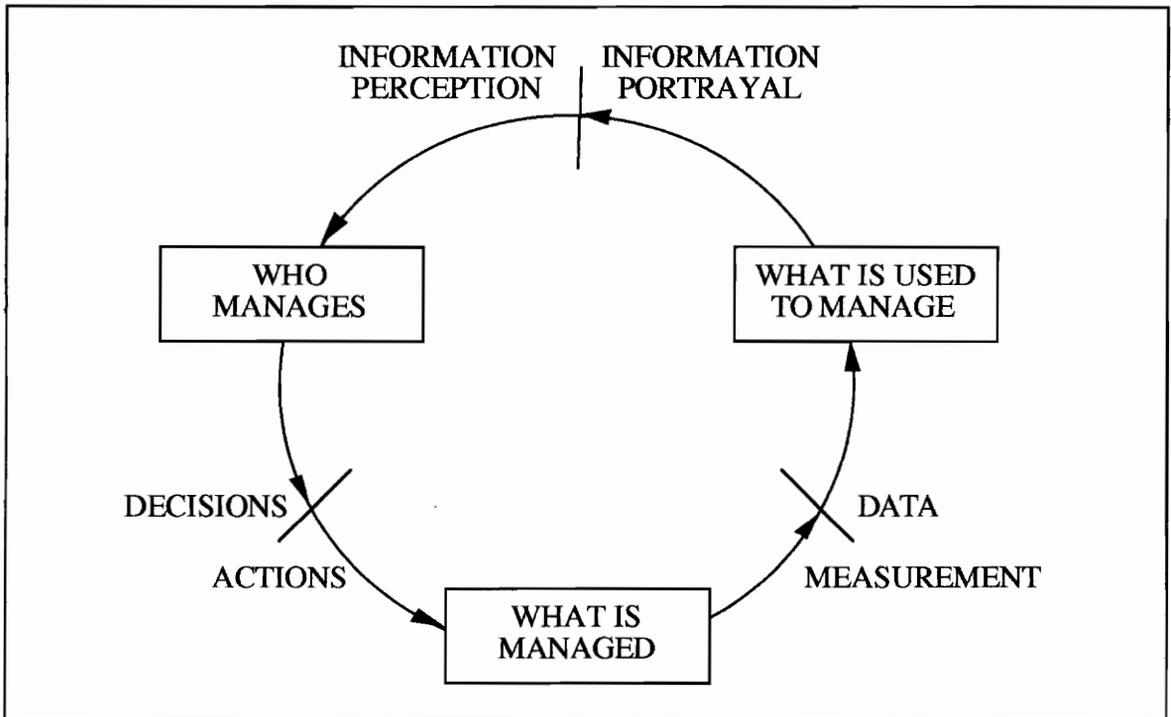


Figure 2-6. The Management System Model (Modified from Kurstedt, 1991)

readily applicable to cases where who manages is a group, whose primary concern is the design and improvement of what is managed.¹² Such is the case in organizational performance improvement programs; however, the model provides a useful framework for experimentation in organizational settings because similar components and interfaces are found in the context of an experimental approach to organizational performance improvement.

¹² Because the writer's emphasis is on the relationship between a program and its effects, the Management System Model is portrayed differently than Kurstedt's portrayal. Because Kurstedt's emphasis is on what is used to manage, what is used to manage is in the 6 o'clock position and what is managed is in the 2 o'clock position. The interfaces relate the components as in Figure 2-5, with the exception that the flow of decisions, actions, measurement, data, and information is clockwise.

2.5.1 A Modified Management System Model for Understanding Improvement Programs

Figure 2-7 depicts a modified management system model. “Who manages,” in an improvement program, are program stakeholders. Program stakeholders are all those individuals or groups who are entitled to define program goals or limits of acceptability because they either affect or are affected by the program itself (see Gray, 1989; Mitroff, 1989; Archer, 1968). Program stakeholders may differ in terms of outcome preferences, belief in cause and effect, legitimacy, willingness, knowledge and skills, level of involvement, demographic factors, power, and roles. In regards to improvement programs, outcome preferences and belief in cause and effect are the two most critical variables determining organizational action and readiness for action (Thompson, 1967). Outcome preferences among stakeholders are translated, via some decision-process, into program goals. Beliefs in cause and effect, while rarely made explicit, determine program goals. Program goals, which, along with activities, represent the decision/action interface.

Program goals are explicit statements of a program's intended effects. Each program goal can be independent of, dependent on, or interdependent with other program goals. In addition, these program goals can differ along the dimensions of time (short-term, long-term), focus (local, global), specificity (clear, ambiguous), achievability (easy, impossible), resource requirements (few, many), measurability (direct, indirect), and importance (low priority, high priority).¹³ Regardless of whether the program goals are short-term or long-term, or whether they are focused on local issues or global issues, in general, goals which are clear, challenging, and measurable are preferable to goals which are ambiguous, easy to accomplish, and unmeasurable (Locke and Latham, 1984).

¹³ A distinction is made here between program goals and program objectives. Program objectives, as used in this context, are the means to achieve goals. Program objectives are therefore classified as a type of activity.

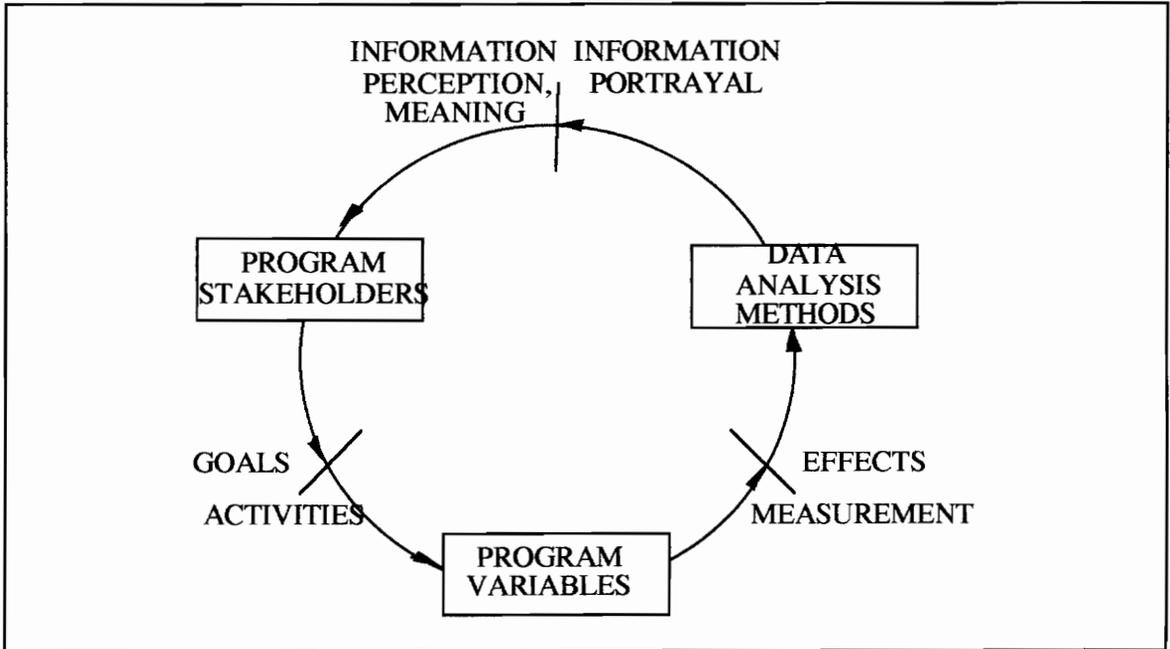


Figure 2-7. A Modified Management System Model

Program goals require some path to achieve them, and program activities may represent this path. Program activities are objectives, actions, or steps which also may be independent of, dependent on, or interdependent with one another. As with program goals, program activities can differ along such dimensions as time, specificity, achievability, resource requirements, and importance (low priority, high priority). In addition, and more importantly, program activities can differ in the degree of certainty relative to achieving program goals, ranging from a certain belief in cause/effect to an uncertain belief in cause/effect.

The variables that comprise the program's reinforcing processes and balancing processes are what is managed. The reinforcing process is what produces, to one degree or another, the desired program effects; it represents the program's theory of action

(Patton, 1986).¹⁴ As the reinforcing process operates, it also inadvertently creates secondary effects (manifested in a balancing process) (Senge, 1990: 6). This balancing process operates to limit the growth or improvement. Balancing process variables comprise the interface and integration of the program with other programs or management systems. Pushing harder on the reinforcing process while ignoring the balancing process only ensures the program will go into decline; the balancing process will take over, causing the reinforcing process to operate in reverse. Because all improvement programs have some type of limiting conditions and factors, attention must be paid to both reinforcing processes and balancing processes.

Prior to, during, and after program implementation, program stakeholders should be provided information aimed at program improvement, modification, and management (formative evaluation) or information aimed at determining program results and effects (impact or summative evaluation) (Patton, 1982). Formative and summative evaluation are not mutually exclusive and can occur simultaneously. Moreover, within each category of evaluation, numerous types of evaluations can occur (e.g. appropriateness, cost/benefit, descriptive, effort, goal-based, goal-free, longitudinal, needs, process, systems analysis)

¹⁴Thompson's (1967) conceptualization that all organizational action is based on one hand in desired outcomes and belief in cause and effect on the other forms the basis of the concept, "programmatically theory of action." The program's goals make the outcome preferences explicit. The program's theory of action makes beliefs in cause and effect among program outcomes explicit. The multiple outcomes produced by an improvement program have a temporal, logical relationship with one another (see Suchman, 1967, pp. 51-56). Taken together, these outcomes constitute a means-end hierarchical chain (Patton, 1986, pp. 153-154). Any given outcome in the chain is the result of the successful attainment of the preceding outcome and, in turn, is a precondition to attaining of the next higher outcome. This temporal sequence among outcomes should not be exaggerated. Once a program is in operation, the relationships between links in the outcome hierarchy are likely to be recursive rather than unidirectional (Patton, 1986, p. 164). Depicting these links in a temporal sequence, however, provides a simplification of reality that lends itself to investigation, yet still provides meaningful information regarding that reality.

(Patton, 1982). Regardless of the category and type of evaluation, all involve data collection, data analysis, and data interpretation.

Measurements are made and data collected on the assessment criteria that stakeholders believe will provide them with useful information. These data can be quantitative or qualitative or both. Program effects are the data. These effects can be classified according to the actual things affected — values, attitudes and beliefs, knowledge and skills, practices and behaviors, performance results — and how these things are affected: purposefully or unintentionally, functionally or dysfunctionally, short-term or lasting. Regardless of the type of program effect, it can have one of four relationships with the program itself (see Ackoff, 1984, p. 15):

1. Cause/effect: a cause/effect relationship between the program and an effect means that the program was a necessary and sufficient condition for the effect to occur.
2. Producer/product: a producer/product relationship between the program and an effect means the program was a necessary but not sufficient condition for the effect to occur.
3. Correlational: a correlational relationship between the program and an effect means the program is not known to be either necessary or sufficient for the particular effect to occur, but that the program and the effect tend to be present or absent together.
4. Spurious: a spurious relationship between the program and an effect is one in which the program and the effect are sometimes present together and sometimes absent together with no discernable relationship.

In addition, program effects themselves may also have one of these four relationships with each other. For example, a change in attitudes may be necessary, but not sufficient for a change in behavior (a producer-product relationships). A successful program sets in

motion causal processes, producer processes, or both, which tend to lead to the desired effects.

The program effects are then analyzed using data analysis methods which may consist of methods like descriptive and inferential statistics or content and pattern analyses. These data analysis methods should be explicit, systematic methods for drawing conclusions and testing the conclusions carefully. During data analysis, the raw data is organized in a form that reveals basic results. The results are then compared to standards of desirability, prior expectations, and hypotheses.

Interpretation goes beyond the data to meaning and practical significance. From this interpretation comes an improved understanding of the program, which can then be translated into recommendations for future action. The cycle depicted in Figure 2-7 then repeats itself; goals may be added, modified, deleted, or left alone. In addition, activities may be altered. Data collection, analysis, and interpretation may be enhanced based on lessons learned.

2.5.2 The Meaning of Experimentation In An Improvement Program

Based on the modified management system model presented in Figure 2-7, for an improvement program to be considered an experimental undertaking it requires, at a minimum that:

1. Program goals be made explicit;
2. The activities which stakeholders believe will achieve these goals be made explicit;
3. The program's theory of action be made explicit;
4. Balancing processes be made explicit (these represent potential moderating or intervening variables);

5. Hypotheses based on the program's theory of action be made explicit;
- 6 Determination, in advance, of evaluative questions, data needs, measurement methods, data analysis methods, and the meaning of evaluation data;
7. Interpretation of results relative to pre-determined standards of desirability, expectations, and hypotheses; and
8. Recommendations to further the program or design the next, subsequent program.

In short, an experiment is any management action in which an explicit conceptualization of the management decision problem is made, hypotheses are raised, evaluative criteria are specified, and data are systematically collected, analyzed, and interpreted (see Morris, 1975). Designing the experiment involves:

...the good sense to admit we are not sure how things are going to turn out and to be clear about what we are testing. It is the good sense to think in advance about what data will be necessary to make some judgment about whether or not what happened was good, and to be very careful about collecting this data and using its message in moving forward to the next experiment. Experimentation done this way is good science, and what many people think is good management is pretty much like good science. (Morris, 1975, p. 279.)

Approaching an improvement program as an experimental undertaking stands in sharp contrast to the typical approach, which tends to leave the theory of action, evaluative questions, and data analysis implicit.

2.6 SUMMARY

Five major findings emerge from the review of the gainsharing literature. First, the interest in gainsharing, as measured by the frequency of published studies, has increased. Between 1946 and 1978, a 33 year period, there were 40 studies of gainsharing. In the 13 year period covered in this review, 1979-1991, there were 55 studies. This finding parallels the results of several survey studies described in Section 1.1, that reported an increasing interest in and application of gainsharing programs.

A second finding suggests that much of the gainsharing literature is not-theory based but is mostly comprised of unsystematic studies. Lack of theory and systematic research may be due to the fact that most of the gainsharing experience is largely in the hands of a small group of consultants or academicians acting as consultants; design and implementation of the client's gainsharing program is primary, while theory and research development are secondary. In addition, the researcher, acting as consultant will often find it difficult, if not impossible, to publish failures or negative findings when a client is paying for the services or research.

The third finding suggests that there are relatively weak case studies or empirical evidence supporting the commonly identified causes and correlates of gainsharing program success in books or in review, integrative, and theoretical studies. Section 6.2 presents a more in-depth study of these causes and correlates of success.

The fourth finding suggests there are an ample number of descriptions on how gainsharing is believed to work, but relatively few theoretical models developed from these descriptions. The theoretical models that have been developed are either directed toward understanding gainsharing processes or structures; are comprised of vague and elementary causal statements for the purpose of analyzing case study information, or are casual,

correlation type models that do not capture the full dynamics of gainsharing programs. To date, a causal model of how gainsharing works has not been developed.

The fifth finding suggests that system dynamics modeling appears to be an appropriate technique for developing a causal model of a gainsharing program. Understanding and delineating a system dynamics model of how gainsharing works — one that captures its full, dynamic complexity — can provide an extremely important conceptual model that program stakeholders could use in designing their gainsharing programs. This could provide program stakeholders with a comprehensive description of how gainsharing is believed to work, thereby providing a fruitful structure through which design changes can be evaluated, hypotheses can be formulated, direction as to which program activities require attention, and direction on which to focus evaluation efforts. At present, organizations either considering a gainsharing program or with a gainsharing program have no useful, causal model from which to tailor gainsharing theory for their specific situations. In addition, researchers have no comprehensive model to guide their investigation of gainsharing phenomena.

3.0 THE RESEARCH METHODOLOGY

This chapter describes research methodology: 1) the research questions; 2) the type of research study conducted; 3) a process flow chart of the research; 4) the site selection criteria; 5) the data; 6) how the data were collected, analyzed, and interpreted; and 7) four methodological issues associated with the collection and interpretation of the data.

3.1 THE RESEARCH QUESTIONS

The broad question to be addressed in this research was: How does a gainsharing program affect organizational performance? More specifically:

1. How does gainsharing work to affect organizational performance in one, specific organizational case?
2. Based on the answer to the above question and the gainsharing literature, how does a gainsharing program work, in general, to affect organizational performance?
3. What variables and relationships are found in the general hypothesized model that do not appear in the specific model?
4. What future research is suggested by the answers to Questions 2 and 3 to enhance our understanding and depiction of how gainsharing works to affect organizational performance?

3.2 THE TYPE OF RESEARCH STUDY

This study is best characterized as applied, qualitative, exploratory research (see Marshall and Rossman, 1989), and addresses the research question: How does a gainsharing program affect organizational performance? The research study was 1) qualitative: the primary data required were verbal descriptions rather than numerical quantities and 2) exploratory: it was a preliminary study designed to identify and portray the variables and causal relationships that may operate in a gainsharing program.

The research methodology selected for this research was the case study.¹ The case study is a research methodology which: (1) focuses on understanding the dynamics present within a single setting; (2) typically combines data collection methods such as archives, interviews, questionnaires, and observations; and (3) is used to provide description, test theory, or generate theory (Eisenhardt, 1989; Yin, 1984). The case study was an appropriate methodology for this research study because this research aimed to depict how a gainsharing program works to affect organizational performance at a single site, and then compare this single site model with other research findings to hypothesize a general case model. Using the case study as the research methodology helped maximize the probability that the researcher understand the phenomenon investigated thoroughly, precisely, and accurately, and allowed adequate data to be collected at minimal time, access, and cost to the case site's managers and staff.

¹A distinction is made here between methodology, method, and technique (see Miller, 1983). A research methodology is a body of methods appropriate for a specific research purpose. A method refers to the means of gathering or interpreting data that are common to all sciences or a significant part of them. A technique refers to the specific procedures that are used in a given method.

3.3 A PROCESS FLOW CHART OF THE RESEARCH

Figure 3-1 depicts, in general, how the research was accomplished. The shaded area in Figure 3-1 represents the scope of the research. At Commonwealth Paper (CP), six top managers were asked to describe how they believe the gainsharing program works to affect company operations and performance. From their verbal descriptions, a site-specific causal model was created and then compared to the gainsharing literature. From this, a general model was hypothesized. Figure 3-2 provides a more detailed look at how the research was accomplished, and Section 3.6 describes each step of the process.

3.4 CASE SITE SELECTION CRITERIA

Three criteria were employed to select Commonwealth Paper (CP) as the case site. First, the case site's gainsharing program had to satisfy the definition of gainsharing used in this research. That is, the case site must have had a reward system program that combined, either formally or informally, some type of employee involvement with a financial formula for distributing organization-wide performance gains (Bullock and Lawler, 1984). Second, the case site had to be within a few hours travel of Blacksburg, Virginia because this research was unfunded and travel was limited by the researcher's funds. Third, in order to gain access to the research site, it was necessary to be acquainted with, either personally or through a third party, an employee in order to establish some prior contact.²

²Jackall (1988, pp. 13-16) provides an interesting account of the difficulties he faced in gaining access to organizations for a study of managerial ethics, a subject which is receiving increasing attention in the management and business literature. Thirty-six corporations refused permission for the study during a ten month search for access. The most common rationales given for refusal were: there were no tangible organizational

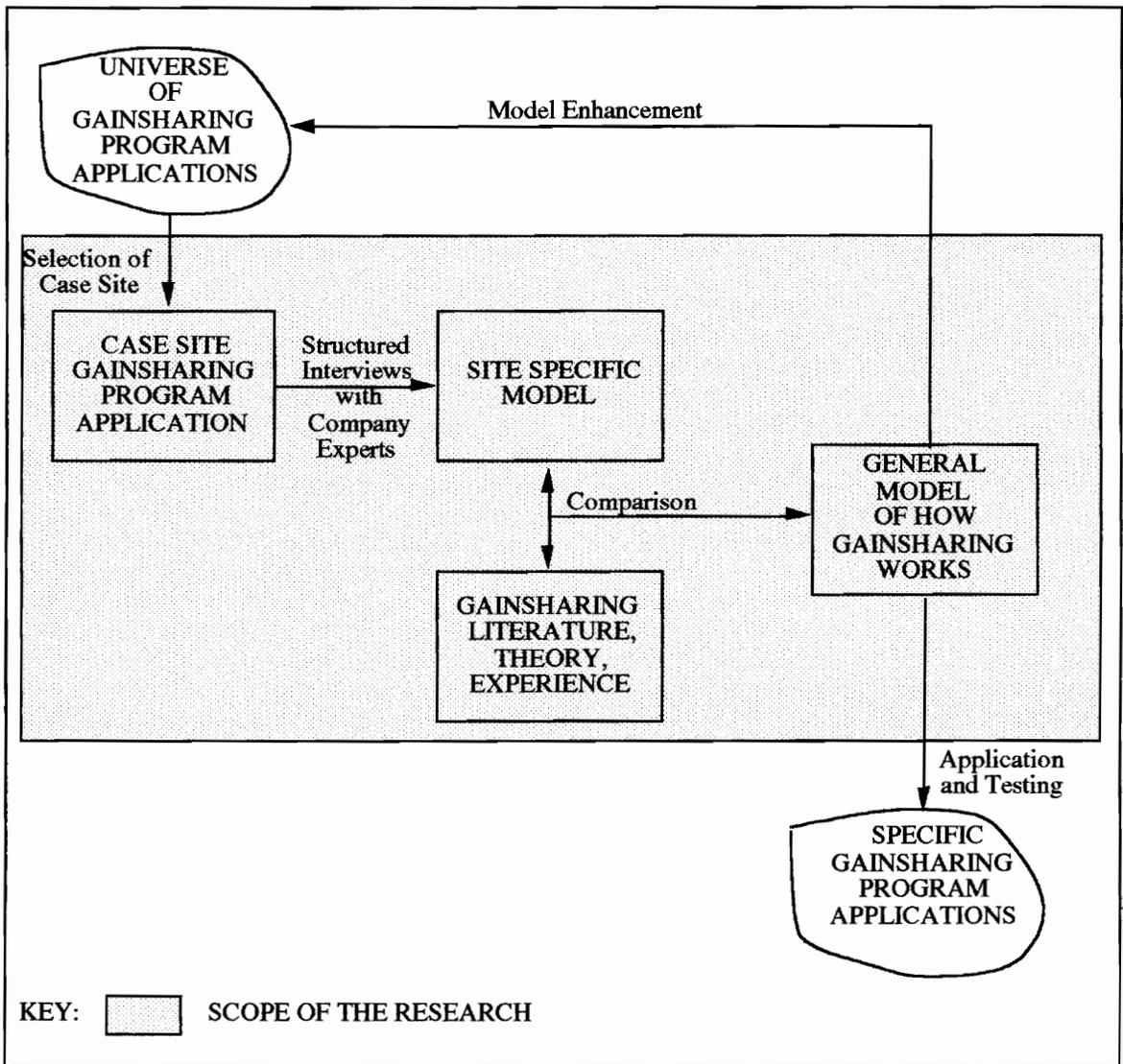


Figure 3-1. An Overview of How the Research Was Accomplished

benefits to be gained from the study because it lacked a specific practical focus, or that timing for the study was inappropriate. Jackall finally gained access to several corporations through “fortuitous circumstances and for reasons independent of any intrinsic merit that my proposed study...may have had.” He became “acutely aware of the importance managers place on being known” and on having “someone who is known vouch for one’s probity” (p. 14).

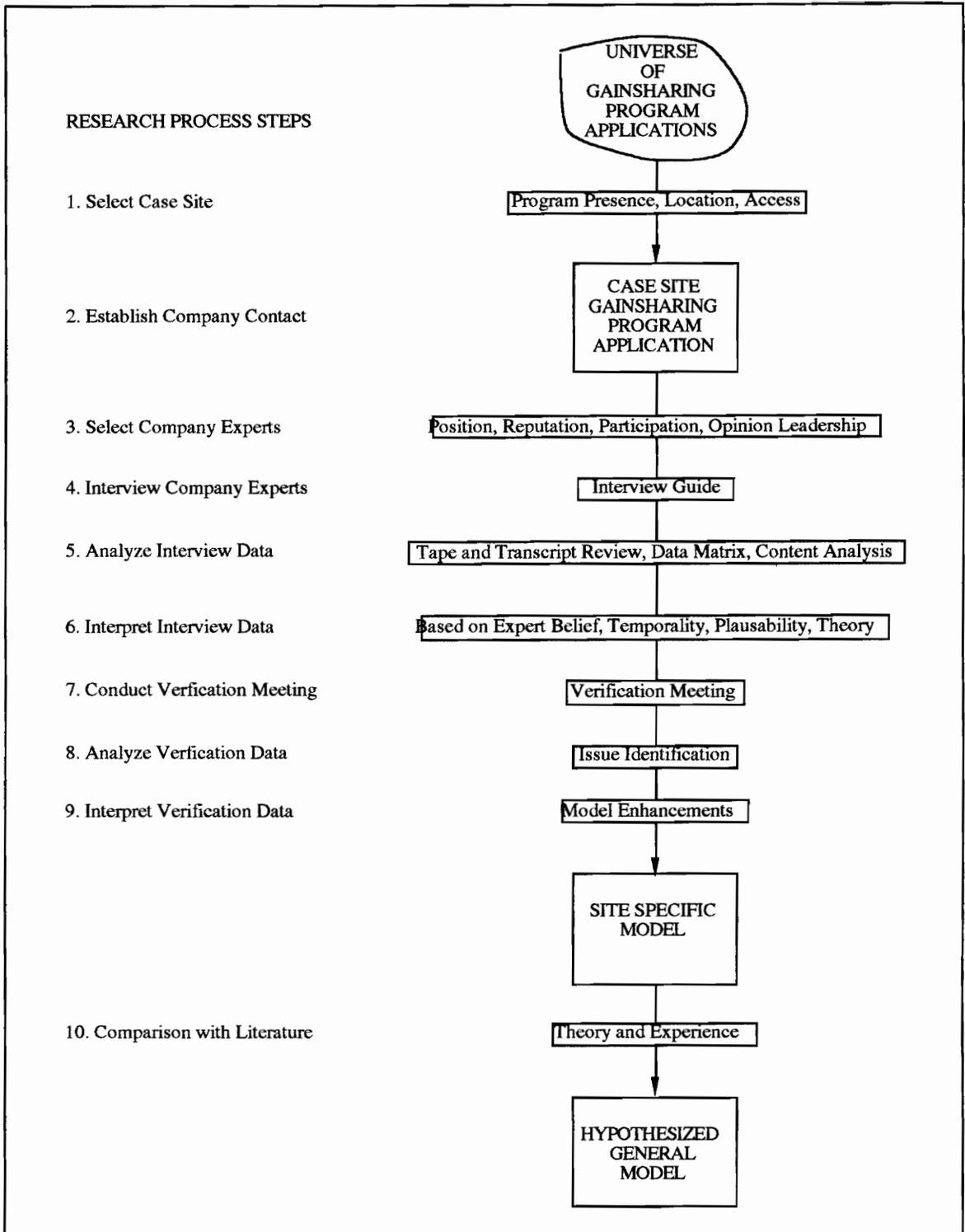


Figure 3-2. A Detailed Process Flow Chart of the Research

These three criteria — program presence, location, and accessibility — provided a case site best described to offer a non-random, purposeful, convenience sample.³

Based on the criteria of program presence, location, and accessibility, I first contacted a manufacturing company located in Southwest Virginia with whom I had done prior research. Because of the time the research would require, the company declined, stating they saw little in it to benefit them. I then contacted Mr. Bob Hutchinson (Vice President, Employee and Public Relations) of CP to whom I had been introduced to December 1990 by Dr. Kenneth J. Kiser. While this research was still in the proposal stage, Mr. Hutchinson (hereafter referred to as Human Resource Manager Hutchinson) had been approached by Dr. Kiser to explore the possibility of their participation in this research. Dr. Kiser was instrumental in securing CP's participation in this research. The high quality, research relationship that Dr. Kiser has had with CP over the years played a major role in their willingness to participate.⁴

³ Even if random sampling were done, there would have been subtle biases in the sample. For example, manufacturing organizations would have outnumbered service organizations, and successful programs (because of their willingness to publicize results and make their program known) would have outnumbered failed programs. In addition, it is highly unlikely that access could have been gained to the vast majority of sample organizations.

⁴A key point should be made here in regard to CP's participation in this project. Because the results of this research were not directly applicable to paper production, and because their gainsharing program has been in place since 1976, their involvement in this project stemmed more from professional courtesy than it did from a perceived need for the research results.

3.5 THE DATA

There were two types of data used in this study: primary data and secondary data (see Leedy, 1985, p. 88). Primary data were the data that lay closest to the phenomenon of interest, which, in this study, were the cause-and-effect relationships operating in the case site's gainsharing program. The primary data collected included six managers' responses to: 1) interview questions designed to identify key variables and relationships in the gainsharing program at the case site, and 2) a follow-up session to verify the model created from interview results.

The decision was made to limit primary data collection to managers for two reasons: time and perspective. Managers typically have greater levels of discretionary time to devote to projects like this research than do operations personnel. At Commonwealth Paper (CP), operators and mechanics work 12 hour shifts, which makes it difficult to gain access to them. In addition, the perspective of supervisors, operators and mechanics, as well as clerical and administrative staff, was thought to be more limited than the perspective of managers who would see more of the program's effects.⁵

Human Resource Manager Hutchinson selected the six managers, based on these criteria, which were explained to him in the memo shown in Appendix B, page 254.⁶

⁵In hindsight, the research would have benefited from this perspective because it would have provided additional data. Because the researcher was sensitive to the time CP was spending on this project, and because the study overlapped with a planned mill shutdown, he never made the request to interview operators and mechanics or clerical and administrative personnel.

⁶Mitroff (1989) identifies seven approaches to identify stakeholders. The seven are imperative, positional, reputational, social-participation, opinion leadership, demographic, and focal organization. This research used the four most appropriate for its purpose: positional, reputational, social-participation, and opinion leadership. The reason for limiting the number of managers to six was to make the interview data manageable. Researchers in organizational settings can be overwhelmed by the data collected in interviews. It was the researcher's thinking that it would be better to have fewer pieces of high quality interview data which he could make sense of, than it would be to have a lot of

- Position - a manager or staffer, who by nature of her or his position, has a relatively broad view of the gainsharing program.
- Reputation - a manager or staffer considered by others in the organization as knowledgeable about the gainsharing program.”
- Participation - a manager or staffer who participates in the design and application of the gainsharing program.
- Opinion leadership - a manager or staffer who tends to shape others opinions regarding the design and application of the gainsharing program.

He selected himself and:

1. Dave Allen, President and Chief Operating Officer (hereafter referred to as President Allen)
2. Mark Bauer, Mill Manager (Mill Manager Bauer)
3. Barry Kohler, Vice President, Finance (Finance Manager Kohler)
4. Chuck Russell, Operations Manager (Operations Manager Russell)
5. John Daniels, Maintenance Manager (Maintenance Manager Daniels)

A description of each manager is found in Section 3.7.2.

Secondary data was helpful in the interpretation of primary data . Four types of secondary data were used where appropriate: (1) CP specific data (see Appendix B, page

data which he could not make sense of. The researcher believed that interview data from six company experts was manageable and would provide quality results. A minimum number of three managers was originally selected because of the multiple selection criteria used. The researcher’s thinking was that no one manager would meet all four criteria equally well, but that three managers probably could meet all four criteria . Three also provided the minimum required for data triangulation. Because of the nature of this research and the type of data required, it seemed preferable to spend more time with fewer managers (e.g. four hour sessions each with three managers) than less time with many company experts (e.g. two hour sessions each with six company experts). As it ended up, four interviews were conducted: two interviews were group interviews lasting two hours, and two interviews were individual interviews, lasting one hour and three hours respectively.

256); (2) published, gainsharing case studies; (3) published, gainsharing empirical studies; and (4) published, gainsharing review/integrative/theoretical studies.

3.5.1 CRITERIA FOR THE ADMISSIBILITY OF DATA

To control the amount of primary data collected, only the above six managers' responses to interview questions were considered. To control the amount of secondary data considered, it was necessary to wait until some meaning began to emerge from the interview data before deciding on the secondary data required from CP. In addition, only those gainsharing case studies, empirical studies, and review/integrative/theoretical studies considered by White (1979) or the researcher as an objective study were used (see Section 2.2).

3.6 SPECIFIC TREATMENT OF THE PRIMARY DATA

Below is a description of how each piece of primary data was collected, analyzed, and interpreted.

3.6.1 THE INTERVIEW DATA

3.6.1.1 How the Data Were Collected. Interviews were scheduled with the study participants through Human Resource Manager Hutchinson. It was anticipated that each interview would be in the neighborhood of two to four hours, which could be spread out over several sessions.⁷ Because of the managers' time constraints, it was decided to

⁷The original two to four hour time estimate was provided by Mr. Daniel Kim of the System Dynamics Laboratory at the Massachusetts Institute of Technology on March 13, 1991. For the purpose of continuity, I preferred that the entire interview be conducted in a single session; Mr. Kim also finds this preferable for collecting interview data. The managers agreed to a single session but the time available for this session varied from three

conduct two group interviews and two individual interviews. The group interviews occurred first, followed by the two individual interviews. The first group interview paired Human Resource Manager Hutchinson and Finance Manager Kohler. This group interview lasted two hours and provided an administrative perspective of the gainsharing program. The second group interview paired Operations Manager Russell and Maintenance Manager Daniels. This group interview lasted two hours and provided an operations perspective of the gainsharing program. The next interview, with President Allen, lasted a hour. This interview provided an historical and cultural perspective of the gainsharing program. The fourth, and last, interview scheduled was with Mill Manager Bauer. This interview, which was scheduled to last one hour, but lasted three hours, provided a relative newcomer's view of the gainsharing program. All the interviews were conducted on the same day, and each interview was tape recorded. Because of the possibility of mechanical failures, two tape recorders were taken to each interview and fieldnotes were taken. In addition, the researcher brought along an assistant, Mr. Mario Beruvides, a doctoral student in industrial engineering at Virginia Tech, to help with the interviews and provide a perspective different from that of the researcher.

The decision to use a team approach to interviewing should be guided by at least four criteria: 1) the comfort level among team members; 2) the interviewees comfort level with the team members; 3) team member's knowledge of the organization where the research is conducted; and 4) team member's knowledge of the subject researched. In regards to the first three criteria, Mr. Beruvides was a good choice. In regards to the fourth

hours (originally scheduled for one hour) to one hour. In hindsight, a better strategy would have been a series of two interviews, the second occurring after meaning began to emerge from the data. The interviews could not have gone much past the time allowed for them because at the time the interviews were done, I was not "smart enough" to ask many detailed questions.

criteria, he was not the best choice. This posed some minor problems for him in following the flow of the interview whenever it deviated from the interview guide.

The fieldnotes taken during the interviews were not much help. Both the researcher, and his assistant, were novices at interviewing. Although they had practiced asking one another the interview questions, they never practiced taking notes. During the interviews, time was spent trying to listen to what the person was saying, showing an interest in what he had to say, and thinking about what the next question should be. Needless to say, few notes were taken. It was also thought that immediately following each interview, our reflections on the interview — its quality and the process — would be recorded either on tape or directly in the fieldnotes, along with any ideas or concepts that may have emerged. However, the interviews happened one after another, leaving no time for this. Again in hindsight, the interviews should have been scheduled over a period of two days. Both the researcher and his assistant were mentally tired after the second group interview.

An interview guide approach was used in each interview because it was thought that it would provide the needed data while being appropriate for the type of person being interviewed. The type of respondent chosen for this study can be described as an “elite” (see Marshall and Rossman, 1989, pp. 94-95). Valuable information can be obtained and complex interactions can be uncovered through in-depth interviewing of elites (Marshall and Rossman, 1989, p. 94). However, elites typically resent restrictions placed on them by narrowly focused questions, like those used in a standardized, open-ended interview (see Marshall and Rossman, 1989, p. 94). Because elites desire a more active interplay with the interviewer, considerable variation may occur in the degree of control both within and between interviews. An informal, conversational interview probably increases this

variation.⁸ Therefore, given the type of person being interviewed, and the need to exercise some control over the amount of variation within and between interviews, the interview guide approach seemed to provide an appropriate balance between an informal, conversational interview and a standardized, open-ended interview (see Patton, 1982: 6).

The interview guide that was used in this research is shown in Appendix B, page 257. Its design was based on Lewin's (1951) Force-Field Analysis Technique. Two critical questions were of great concern in regards to this interview guide: (1) What happens to the research if the theory guiding the research is wrong? and (2) Will I be able to tell this from the data? Because the queries in the interview guide queries were intended to construct both positive and negative feedback loops, the basic building blocks of systems, they represented a complete set (Forrester, 1975).⁹ The content analysis employed on these data revealed inconsistencies with the original theory and helped identify new or different model sectors. Originally it was believed that the site-specific model would be comprised of four sub-sectors and follow a system archetype called "limits to growth" (see

⁸Human Resource Manager Hutchinson had provided each manager with a copy of the interview guide, which they had with them during the interviews. As it turned out, the two group interviews — one with Hutchinson and Finance Manager Kohler and the one with Operations Manager Russell and Maintenance Manager Daniels — followed the interview guide fairly close. President Allen's interview, which was only an hour in length, was more informal, but focused on the set of questions in the interview guide. Mill Manager Bauer's interview, originally scheduled for one hour, but lasting three hours, was extremely informal. At this point in the day, both the researcher and his assistant were tired. They tried to gain control of the interview, but were unsuccessful. Despite the free flowing nature of this interview, valuable information was collected.

⁹One of the most important and potentially most empowering insights to come from the field of systems thinking is that certain patterns of structure (or archetypes) occur again and again, producing qualitatively similar results or patterns of behavior (Senge, 1990). Structure, as used here, refers to systemic structure, the key interrelationships among variables that influence the behavior of a system over time. Once a systems archetype is identified, it provides an explanation for the patterns of behavior at a level at which these patterns can be changed. It also suggests areas of high- and low-leverage change. All of the systems archetypes are made up of three systems building blocks: reinforcing processes, balancing processes, and delays. Reinforcing processes amplify or accelerate growth or decline. Balancing processes stabilize a system in relation to some goal, norm, or resource. Delays are interruptions in the flow of influence between cause and effect.

Senge, 1990). As meaning began to emerge from the data, six sub-sectors were identified, and it became clear that the site-specific model followed a system archetype called “eroding goals” (more will be said about this in Chapter Five).

3.6.1.2 How the Data Were Analyzed. Each interview tape was transcribed and a copy provided to the person interviewed, accompanied by the cover letter shown in Appendix B, page 258. The transcripts were returned by five of the six managers. It seemed that some managers were concerned that the transcripts made them look inarticulate. Their corrections were focused more on improving sentence structure rather than on clarifying content. For example, one manager, using the transcript as a guide, re-dictated his thoughts and had them transcribed by his secretary. The one manager who did not return the transcript, Mill Manager Bauer, told me that he did not have any changes to make.

It was originally thought that once the transcripts were returned, I would code them and then transfer the coded data to a matrix for data analysis. First, sections of the transcript would be grouped according to whether they relate to the four sub-sectors believed to comprise the site-specific model: 1) participation sector, 2) the bonus payment sector, 3) the information sharing/performance measurement sector, and 4) the performance impact sector, or other (i.e., those sections of the transcript that lie outside the other four). Second, the elements identified within each section would be coded. Because it was believed that the site-specific model would more than likely follow a “limits to growth” structure, the elements were to be coded as either a growing action, slowing action, performance condition, limiting condition, or causal linkage. Once coded, the variables and relationships would be transferred to a matrix that listed the six managers on the X-axis and the elements on the Y-axis. There would be one matrix developed for each of the above four sectors.

After listening to the interview tapes twice, reading through the transcripts several times, and taking detailed notes, it became clear that the above coding scheme was too mechanistic and would not work. The coding scheme assumed the interviews would be more linear and have clearer boundaries delineating responses than the interviews actually were. The coding scheme was dropped and the cause-and-effect relationships identified in each interview were listed.

3.6.1.3 How the Data Were Interpreted. Through the exercise of listening to and reading the interview tapes, taking notes on the interview, and completing the data matrices described above, common themes began to emerge. The cause-and-effect relationships listed in the above data matrices were grouped by these themes. Once these matrices were completed, the site-specific model was ready to be created. The following four questions were used to help order the elements into a causal model (see Miles and Huberman, 1984):¹⁰

1. What cause-and-effect relationships do the managers claim are present?
2. Which variables occurred first in time, which occurred along the way during implementation, and which might be seen as early and later outcomes?
3. Which variables might reasonably be expected to have a direct impact on other variables, both preceding them in time, and having a plausible direct connection?
4. What does the available research and theory have to say about causal connections?

¹⁰It was originally thought that the elements comprising the various cause-and-effect relationships would be transferred to index cards, and these index cards could then be arranged into a model. The final arrangement would then be transferred to paper and a descriptive narrative written. The problem with the index cards was that I could not get a sense of the whole model with the cards. Therefore, I went directly to sketching model versions on sheets of paper.

A number of model versions were developed before I became comfortable with the one described in Chapter Five. The process of model development became an iterative one of (1) trying to piece together a model based on the above rules and (2) returning to the original interview data and secondary sources for supporting evidence. These two steps were repeated over and over again as each model version unfolded. The second step, in particular, was important because there were several instances, in early model versions, that there was no supporting evidence in the interview data for some of the model relationships. In the process of model creation, I had inferred too much.

3.6.2 THE VERIFICATION MEETING DATA

3.6.2.1 How the Data Were Collected. Each company expert was sent a copy of the site specific model described in Chapter Five and a summary narrative (Appendix B, pages 259 to 262). It was originally thought that model verification would occur through a questionnaire mailed to each manager. The questionnaire data would then be coded using the same coding scheme originally intended for the interview data and then transferred to a data matrix so a content analysis could be performed. Because the researcher believed that the final model would more than likely overwhelm the managers, he thought he would get better results by conducting it in person. Therefore, a one hour meeting was scheduled by Human Resource Manager Hutchinson to review the model. He, Mill Manager Bauer, Finance Manager Kohler attended this meeting. The meeting followed this agenda:

1. Purpose of the meeting
2. Bauer, Kohler, Hutchinson give their views of the model
3. Key variables in model discussed
4. Review of incentive bonus sector narrative

5. Review of production sector
6. Discussion on information sharing
7. Wrap-up

3.6.2.2 How the Data Were Analyzed. A number of key issues were identified in this meeting and are discussed in Section 5.7.

3.6.2.3. How the Data Were Interpreted. Based on the results of the verification meeting, two minor changes were required in the incentive bonus sector of the site specific model. The final, causal model was then compared to the gainsharing literature and a general model of how a gainsharing program works to impact company performance was hypothesized.

3.7 METHODOLOGICAL ISSUES

There are four methodological issues that all research must address, but are particularly problematic for qualitative research studies: representativeness, reactivity, replicability, and reliability (Katz, 1983). A discussion of each follows.

3.7.1 REPRESENTATIVENESS

This research confined itself to the study of a gainsharing program at one company and interviews with six managers at that company. The study will have some value as a site-specific case, and some generalizations can be made. Case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes (Yin, 1984). The case study, like the experiment, does not represent a “sample,” and the researcher’s purpose is not to enumerate frequencies (statistical generalization). Rather, the researcher’s goal is to expand and generalize theories (analytic generalization). Because this research study is exploratory in nature, theory is being generated. So that careful

generalizations can be made, the research site is described in Chapter Five and the limitations of the research are fully stated in Section 1.5.3.

3.7.2 REACTIVITY

In this study, six manager were interviewed for different lengths of time, at different times, and in different places, and an interview guide was used rather than a fixed questionnaire. In addition, working with company experts like these six managers placed great demands on the ability of the researcher, who needed to establish competence by displaying a thorough knowledge of the subject or by projecting an accurate conceptualization of the problem through shrewd questioning (Marshall and Rossman, 1989). Differences reported in the data may simply reflect differences in researcher behavior rather than actual differences as perceived by these six managers.

The credibility of interview and questionnaire data rests on the credibility of those who participate in those interviews and questionnaires. Therefore, the following background data is provided for each of the six managers interviewed:

1. Dave Allen, President and Chief Operating Officer. President Allen has been with Commonwealth Paper (CP) since the beginning, gradually taking over for the founder, Rich Neal. Prior to joining CP, he was working in the corporate headquarters of a large paper company when Chairman Neal asked him to help start CP. Because of his background in accounting and finance, and the influence he has had over the evolution of CP, the organization is to a large degree “accountant driven.” However, he provides balance to this accountant approach by telling managers to “spend money where it makes sense.” He is one of the original designers of the gainsharing program. When asked what he would do over at CP if he could do it all again, he said:

The only thing that has bothered me for years is this incentive compensation program. Not that we have one, but that we didn't think it through enough. It should have been put to the test, rather than just the Board of Directors making a quick decision...I would have tailored it a little differently so that it was somewhat self-adjusting and self-correcting. We paid incentive one year when we lost \$3 million...So, if I had to do it over again, I would do it slightly different. With the experience I've had over the last 15 years, I could design one now that would be perfect.

President Allen calls the gainsharing program “the cement” that holds together the partnership. Because his son has a Ph.D. in ornithology, he has a special affinity toward academicians.

2. Bob Hutchinson, Vice President, Employee and Public Relations. Human Resource Manager Hutchinson has been with CP for 15 years. His primary responsibilities include pay and benefit program design and administration, safety programs, training programs, security, public relations, and the performance improvement process. Prior to joining CP, he was personnel manager in the Research and Development Division of a nuclear power plant construction consulting firm. While he recognizes the importance of hard performance measures like production and cost, he thinks of CP's performance more as a “health” issue and identifies cultural issues like trust, openness, loyalty, and confidence. He believes the gainsharing program is a “bonder.”
3. John Daniels, Maintenance Manager. Maintenance Manager Daniels has been with CP for 15 years and is two years away from retirement. His primary responsibility is to maintain the mill and keep it operating at its capability. Top managers are concerned that when he leaves, they will be missing something

very important because he is —according to Mill Manager Bauer — “the people’s voice” on the management team. Bauer went on to add that “John’s worth to this company is invaluable.” The story of his career, told to me by President Allen, is worth recounting:

John is a guy that didn’t finish high school. He has cut pulp wood for a living. He’s run a moonshine still for a living. He learned to weld when he was...making moonshine: vats, tubing, and all that stuff. He became a machinist, taught himself, lucked up and got a job at a paper mill when it was newly built and was just hiring anybody that walked in...They just needed bodies and John happened to be one of the bodies. He has a knack for machinery, repairing stuff. He moved up and learned several trades while he was working with the paper company. He became a union member, a union steward. One of the best, toughest union stewards that they ever had at the Big Northern Paper Company. Became a foreman down there...We had some problems here and lost our maintenance manager. And so (the mill manager) picked up the phone and called John...John is people. John is a leader of people. They follow him. Who works with him? All of those mechanics. He’s very protective of his people. He goes to bat for them. He speaks frankly to them. But he’s like a sergeant on a battle field. His troops will follow him to the jumping off place.

He believes the gainsharing program is the difference between “union and non-union.” If he owned a mill, he would “definitely have a gainsharing program.”

4. Barry Kohler, Vice President, Finance. Finance Manager Kohler has also been with CP for fifteen years. Prior to joining CP, he was an accountant in a CPA firm where the only incentive was “work seven days a week or be fired.” While he believes that hard performance measures like production and cost are important, he also recognizes the importance of softer measures. He believes the gainsharing program is a “motivator,” but the efforts put forth by people “go beyond it.”

5. Mark Bauer, Vice President, Mill Operations. Mill Manager Bauer is the third mill manager that CP has had, joining the company in 1989. Both Maintenance Manager Daniels and Operations Manager Russell report to him. His last job in the paper industry, before leaving it to pursue other interests, was Vice President and Assistant General Manager of a 1500 employee, five paper machine, largest newsprint manufacturer in North America. At his former job, he was moving in the direction of participative management and statistical process control when his boss, the general manager, retired. The new general manager did not see the need for group decision-making and quality management, and Bauer eventually resigned, fed up with the management practices. According to President Allen, he was the perfect fit for CP. Since he has been mill manager:

...we were able to move forward toward fully implementing participation in planning, adopting (statistical process control), developing training programs, and implementing other programs that are important to us. We began to truly pull the team together like we had never been able to do before. Everyone did not make the transition, and it was necessary to make some changes. It's very important that when you bring a person aboard that he believe in the philosophy of the company and fit within the culture.

The gainsharing program is, in Mill Manager Bauer's words, "a fascinating twist" because he had never been exposed to that type of compensation before. He believes the incentive program is a "powerful force" at CP.

6. Chuck Russell, Operations Manager. Operations Manager Russell has been with CP for 15 years. His primary responsibility is the day-to-day operation of the mill. Four department managers report to him: the paper machine manager; pulp, power, and woodyard manager; environmental manager; and shipping/transportation manager. According to Russell, responsibility for "98%

of the tons produced” is between him and Maintenance Manager Daniels. His career in the paper industry began in 1964. Commonwealth Paper is the third paper mill he has worked in, and the first non-union paper mill he has worked in. The second paper mill had a stock plan that required employees to be with the company five years before they could cash-out of the plan without penalty. “So I stayed there five years and two weeks and left” to join CP. Unlike Maintenance Manager Daniels, he has always been a manager. He is well-respected by other managers. Several top managers told the researcher that under the previous two mill managers, he was never provided the opportunity to make the contributions he is making today. He believes that the gainsharing program is the reason “we’re here today.”

In addition to manager’s bias, there is also researcher bias. I believe that:

1. Commonwealth Paper is a well-managed organization. They do more things right than any organization with whom I have had experience within the past ten years.
2. The gainsharing program is not a politically sensitive issue. The managers interviewed had nothing to gain or lose through their participation.

The case study description found in Chapter Four provides the reader a view of CP as I see it.

3.7.3 REPLICABILITY

To provide replicability, this chapter has provided a description of the actual methodology, and the reasons why the methodology differed from the planned methodology.

3.7.4. RELIABILITY

Although this chapter has specified how the data were collected, analyzed, and interpreted, there is still room for decision-making and judgment to occur when following the research methodology. For example, the meaning found in interview data was subject to interpretation. Similarly, comparing results across interviews lends itself to interpretation, and managers, themselves, may leave some things out. Relying on the manager's verification of the model is not as strong as an actual test of the model based on predictions of hard and soft criterion measures. However, a predictive test of the model would, at a minimum, require one year's worth of performance data. The time constraints of a dissertation make such a test unfeasible. How can the researcher claim the model developed is correct?

The validity or significance of a model depends on:

1. Its suitability for a particular purpose (e.g. designing an improved program or system),
2. Its ability to forecast macro behavior (e.g. the results of design changes),
3. Its scope,
4. The defense of the details of the model structure and variable interactions, and
5. The validity and precision of the sources from which the contents of the model are drawn (Drew, 1989).

Given that this research was not assessing the suitability of either the site-specific or general model for design activities, and was not assessing either models' ability to forecast macro behavior, model validity rests solely on the defense of the details of model development and the validity and precision of the data sources used. Therefore, only a weak claim can be made that the site specific model is "correct" and no claim can be made that the general hypothesized model is correct. However, the research findings and conclusions still have value because of the exploratory nature of the research. Research must start somewhere; this research is a start, something on to which others will perhaps build.

4.0 THE CASE SITE

A widely held, but unspoken, assumption in management consulting circles, business schools, and even industrial engineering departments, is that organizations are “thin.” Thin in the sense that organizations are comprised of a handful of mutually exclusive components — like culture, strategy, technology, structure — layered quite neatly on top of or next to one another, interacting with one another in rather straightforward, simple linear fashion. Organizational description (and understanding) becomes, under the thin assumption, an exercise in analyzing hard performance measures, administering instruments, holding focus group sessions, conducting surveys, or performing audits. While this exercise may yield valid and useful information, the description that often follows is somewhat sterile, lacking a certain richness and depth of insight. The organization seems thin.

In direct contrast to the thin assumption is the view that organizations are “thick” in the sense that they are comprised of a dynamic multiplicity of structures, systems, processes, histories, and people, which are all superimposed on and interacting with one another (see Geertz, 1973). Thick description requires, at a minimum, that a significant amount of time be spent with an organization, often as a participant member, collecting and interpreting data. And even these longer term internal accounts — accounts more likely to be found in the fields of anthropology or sociology — are limited by both perspective and time. For the outsider who has had limited exposure to an organization to claim to have

provided a thick description of that organization is more arrogant than accurate (see Geertz, 1973).

The description that follows is to the right of thin, but far short of thick. With the exception of two weeks of direct, on-site contact at Commonwealth Paper (CP), the company has mainly been observed at a distance the past ten months. However, because there has been an opportunity to indirectly observe CP through the eyes, ears, and findings of colleagues — in particular Dr. Kenneth J. Kiser of Oklahoma State University who has attempted to go beyond the thin description characteristic of most case study research.¹ Yet, like most case study descriptions found in the gainsharing literature, the researcher relies on anecdotal evidence, personal observation, and documentation that was either asked for, was given, or stumbled upon. The purpose here is simply to describe CP as the researcher sees it, in the hope that it lends the reader better insight and understanding of the research and its results. This description is organized by these topic areas: 1) history, 2) geography, 3) product, 4) mission and vision, 5) organizational structure, 6) production process, 7) performance, 8) performance issues and plans, 9) mill modernization, 10) participative management practices, 11) information sharing practices, 12) workforce characteristics, 13) culture, and 14) pay, benefits, and the gainsharing program.

¹See Coleman (1990), Kiser (1989, 1990, 1991), and Van Aiken (1991).

4.1 HISTORY

History is inextricably woven into CP's vision, mission, plans, structure, processes, and culture. It is found in the "Annual Report to Employees" and appears in company brochures and marketing literature. It starts quarterly planning sessions and 4th Working Day meetings, and arises in conversations with managers.

The idea for CP began in October of 1973, when the Chairman, Rich Neal, and the President and Chief Operating Officer, Dave Allen, were working in the corporate headquarters of a large, southern paper mill that produced liner board and medium which goes into the manufacturing of corrugated boxes. Chairman Neal approached President Allen about starting a company that was

different than what we normally find in the business world. One that is staffed leanly. One where people don't have any specific job description, but where a group of talented people come together, know what's got to be done, and go ahead and do it. And in the end, they all share equally in the performance of the company (Allen, 1991).

Chairman Neal, who had held several sales and marketing positions in industry, wanted to create an independent mill to produce semi-chemical corrugating medium. He envisioned a state-of-the-art facility that would supply the independent and integrated container industry with unequalled quality, service, and assurance of supply continuity. President Allen was asked to help raise the funds because of his finance background.

It took about two years to put the financial package together. Chairman Neal could only raise \$1 million at the time and they were having trouble borrowing the rest. Every investment banker on Wall Street refused to finance the project. Finally, they found a banker who agreed to put a financial package together if Neal and Allen could come up with

\$6 million in equity. Eventually, they raised the \$6 million and borrowed \$44 million. The mill, in the words of a contract engineer who worked on its construction, was built on a “shoe string and a prayer.”

During the two years it took to put the financial package together, Chairman Neal was thinking about the principles under which he wanted the company to operate. He spent quite a bit of time talking with the minister of his church. As a result of these discussions, he came up with the “Ten Commandments” (Figure 4-1). These are the guiding principles that outline management’s responsibilities. In 1988, these Ten Commandments were renamed the “Principles of the Partnership.” According to President Allen, these principles are the one thing that will not change at CP.²

The mill began operations in August 1975 at an average daily rate of 450 tons. When people were hired, it was explained to them that the company was going to be different, that it would be a close-knit group. There were not going to be restrictions on what you could do — everyone would be expected to do their best and help their fellow worker. One thing both Chairman Neal and President Allen wanted to create was an environment in which employees would feel no need for a union.³ Because of the culture CP has, and because of the way everybody works together and participates in the performance of the company, there has never been any serious talk of a union organizing drive.

Chairman Neal and President Allen also knew that to make the partnership work, they had to have a program that would allow everyone to share in the growth and

²These principles were reviewed by top managers during a strategic planning session in December 1990. There was some discussion regarding the last principle, regarding equal employment opportunity. This one could, it was argued, be removed because it is required by law. However, history came into play here in that they were referred to by President Allen as the Ten Commandments, and “there shouldn’t be nine of them.”

³The paper industry has been, and still is, union dominated.

Principles of the Partnership

Commonwealth Paper regards itself as a partnership enterprise which offers its members opportunity, incentive, recognition and security. With this in mind, corporate guidelines, entitled, "Principles of the Partnership", have been established to express how this Partnership should function and how its members should act:

The Partnership is committed to:

- Promote the dignity and worth of each member of the Partnership
- Provide competent leadership which instills confidence in the members.
- Encourage the members to maximize their potential by providing the opportunities, training and rewards for so doing.
- Promote from within based upon experience and performance whenever possible.
- Provide a fair and equitable compensation package which includes benefits that provide financial security for all members.
- Operate the mill in a safe and environmentally responsible manner, protective of employees and the community.
- Encourage open communication and active participation of members to improve the enterprise and minimize conflicts.
- Develop and implement an ongoing planning process that ensures the Partnership maintains a competitive position in the marketplace.
- Produce a product of high quality and performance which continually meets the changing needs of our customers and which is backed by the best service and reliability in the containerboard industry.
- Provide equal employment opportunity, without regard to race, color, sex, national origin or age.

Figure 4-1. Commonwealth Paper's Ten Commandments
(Source: Commonwealth Paper Annual Report to Employees, 1991)

performance of the company, and they wrestled with how to do that. Finally, they came to the conclusion that the performance of the company could be measured in tons of production that the paper machine made. They designed an incentive program that based bonuses on production tonnage. That program, which is the focus of this research, is described in Section 4.14.

The early years of CP, 1975 to 1979 is referred to by managers as the survival stage. The mill had a lot of problems and the company was virtually bankrupt during that period, mainly due to an unanticipated, depressed market for corrugating medium worldwide. Managers were preoccupied with trying to get the mill producing what it was capable of so that the debt could be serviced. And so were operators and mechanics because, even though CP was just starting up, information was being shared so everyone knew what the situation was. While the company was not in a position to get people to participate as they are today, as far as the principles of the partnership were concerned, sharing information, treating people fairly, and answering any questions was the rule.

The growth period was from 1980-1988. During this period, CP became more stable, with a good production growth curve and an excellent customer base. During the first ten years, however, Chairman Neal and President Allen were not able to fulfill all their ambitions to be the type of participative company it set out to be. Eventually, they reached a point where Allen believed “it’s really time to fulfill our desires for the company to be a true partnership.” So, in 1988, they embarked on a process of strategic planning for improvement. Because this process represents a fundamental shift in the way the company is managed, the period since 1988 is referred to as the “New Era” period.⁴ The focus since

⁴All of the organizations the researcher has had contact with the past ten years have labeled improvement programs with catchy names, slogans, and acronyms. Commonwealth Paper is different in this respect. While some top managers refer to the New Era, its use is not widespread or visible. The strategic planning process is simply viewed as an improved way of managing the business.

1988 has been mill modernization and expansion, remaining debt free, and implementing a process for the continuous improvement of quality and productivity.

Today, CP is the world's largest, independent producer of semi-chemical corrugating medium. It ranks 10th among all U.S. producers with 3.3% of the market. A review of CP's history reveals that:

1. From its inception, CP was designed to be different. The Ten Commandments (or Principles of the Partnership) were its design specifications.⁵

2. The paper production process has always been the focus of everything CP does.

3. There is widespread recognition among CP managers and employees that what CP has is special, yet fragile. Eighty five of CP's 258 employees have been with the company since the beginning and remember the survival period. One hundred seventy seven of the 258 remember the growth stage. Commonwealth Paper to this day remains a small mill competing against industry giants like Georgia Pacific, International Papers, and Weyerhaeuser.

4. There is an implicit guarantee of employment security and there have never been layoffs. The philosophy, according to President Allen, is to "always run the mill full and worry about selling the stuff later." Allen adds that "we've had to pull a lot of rabbits out of the hat to keep the mill full of orders during the last two years." While this problem may intensify with expanded production capability, CP is working to position itself as the most desired supplier of semi-chemical medium.

5. There is a strong desire on the part of Chairman Neal and President Allen to remain debt free; for example, all mill modernization projects are financed from cash flow.

⁵It is interesting to note that guiding principles became popular in the late 1980s. Commonwealth Paper had them in the early 1970s.

4.2 GEOGRAPHY

Commonwealth Paper is located in the Southeast United States on a 1,200 acre site in a rural county. The abundance of wood supply, proximity to major markets, and the reputation of the area's strong work ethic are the reasons CP selected the site for its mill.

4.3 PRODUCT

Commonwealth Paper produces corrugated medium, the wavy, center ply found between the walls of corrugated boxes. The mill, due to its configuration, has no alternative grade capabilities. Medium is primarily a commodity product but there is an increasing emphasis on both product quality and recycled content. Because linerboard (the corrugated box wall) is becoming lighter weight, the medium is making a more significant contribution to the performance of the finished box. Product characteristics that determine medium performance are:

1. Concora - crush strength after fluting of sheet
2. Cross-directional ring crush - measurement of compressive strength of the sheet.

Recent test results on competitive semi-chemical medium has shown CP to be low on cross-directional ring crush but competitive on concora.

3. Moisture, cross direction - variations in moisture across the width of the sheet.
CP's cross-directional moisture continues to be about the best in the industry.
4. Basis weight, cross direction - variations in the basis weight across the width of the sheet.

At the present time, a cross-functional team from sales and operations have formed to clarify and recommend a plan to produce acceptable medium grades with specifications

for the above factors as required by customers. The quality specifications in use today are focused more on the market than on specific customers. Operations managers believe that technological improvements (which are readily duplicated by large competitors) often raise the “level of the commodity” regardless of the performance requirements of customers. Sales and marketing managers believe that as “quality increases, competitors decline.” The answers to these two questions — “Who is the customer?” and “What level of quality do these customers expect?” — are critical to the mill’s continued competitiveness and profitability. Where a high level of performance is not needed, operations managers would like to run the paper machine faster, producing more tons at a lesser cost.

Other product characteristics that do not necessarily determine medium performance but do contribute to customers’ (box plants’) corrugator runnability are:

1. Caliper - thickness of the sheet
2. Tensile - breaking strength when stretched
3. Stretch - elasticity
4. Coefficient of friction - a measure of the resistance of the sheet as it moves across a surface.

4.4 MISSION AND VISION

Commonwealth Paper’s mission is to position itself as the most desired supplier of semi-chemical corrugating medium in the containerboard industry (Commonwealth Paper Strategic Plan, 1991). The company’s vision for the year 2000 is to become an industry leader that:

1. Continually improves product quality and customer service to anticipate and to meet the ever-changing needs of the marketplace;

2. Continues to improve and modernize plant, equipment, and facilities;
3. Pursues growth opportunities for itself and its employees;
4. Employs a process of strategic planning that provides an opportunity for every employee to participate in the ongoing improvement of individual and company performance;
5. Provides training that meets the needs of the company and its employees;
6. Provides financial security for its employees both during and after their work years; and
7. Abides by its guiding principles, the "Principles of the Partnership," in conducting its internal and external business (Commonwealth Paper Strategic Plan, 1991).

4.5 ORGANIZATIONAL STRUCTURE

The formal organizational structure is found in Figure 4-2. This structure was designed to support the production process and is characterized by its flatness. Top managers view this structure as one level (all these managers participate in strategic planning), with supervisors forming the next level, and operators and mechanics, clerical and administrative the next level. In addition, there is a President's Operating Committee comprised of President Allen, Mill Manager Bauer, Human Resource Manager Hutchinson, and Finance Manager Kohler. In 1991, there were, not including extra board or part-time employees, 64 exempt employees, 150 mill operating employees, and 30 clerical employees.

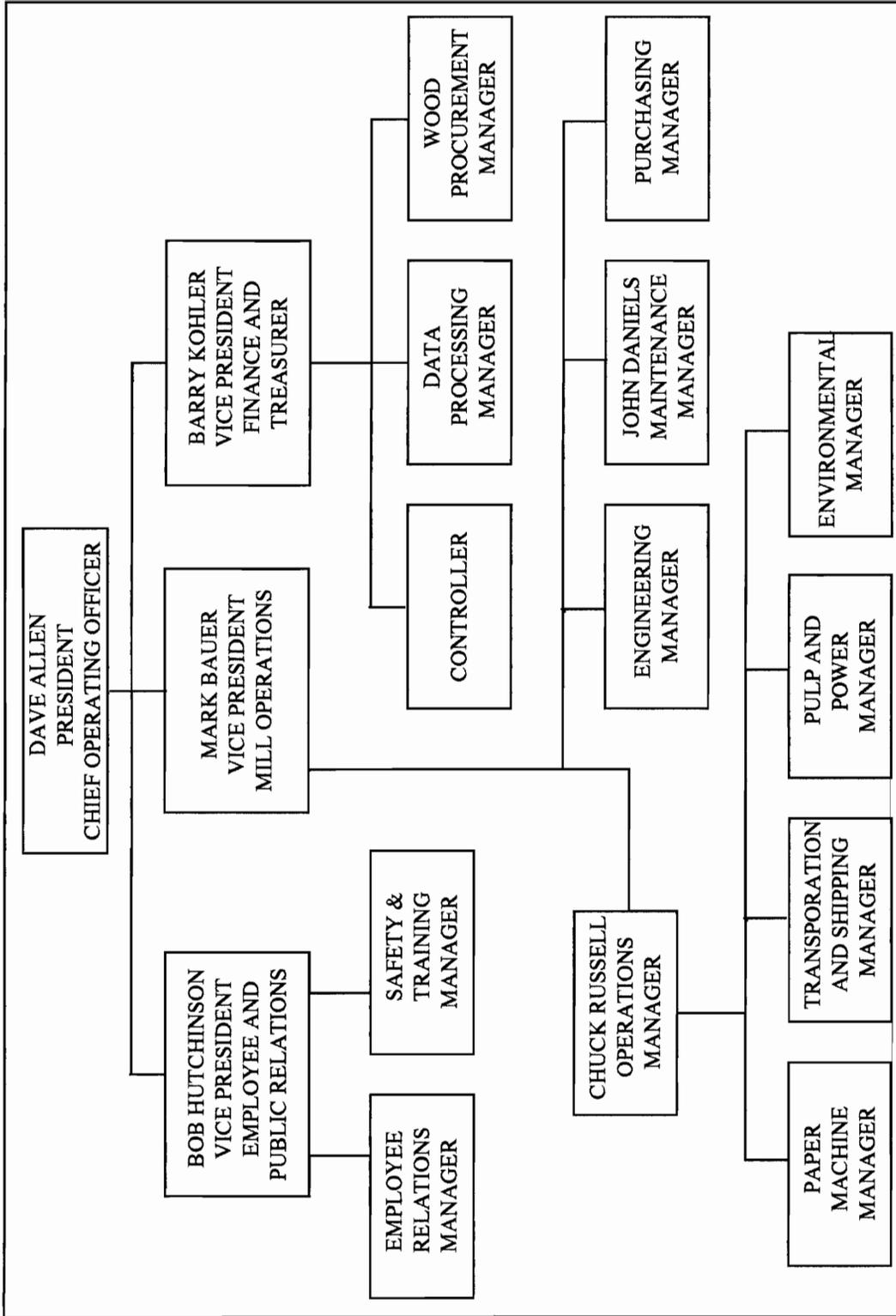


Figure 4-2. Commonwealth Paper's Organizational Structure

4.6 PRODUCTION PROCESS

A macro-level process flow diagram of the production process is provided in Figure 4-3. Paper production is so important to the success of CP that one cannot spend a day with its top managers and not learn more than expected or bargained for about making paper. Because CP is small in comparison to its competitors, it cannot control the selling price of its product, which has declined by 33 percent the past 29 months, making cost control and production critical not only to profitability but to the survival of the company itself.⁶ There is widespread belief among top managers that if they can get “tons out the door,” everything else will fall in place. This belief is echoed in statements by top managers calling production “the only way we can help ourselves,” “our salvation,” and the one thing that the “mill lives and dies by.” And the paper machine is referred to as “the heart and soul” of the entire operation.

Paper production is a capital intensive, continuous process operation. The rate at which paper can be produced and the amount of time paper is being produced are the key determinants for production performance, as measured in tons. With each increase in the production rate, more tons can be produced per unit of time. And, with each percentage increase in machine efficiency — the ratio of uptime or paper machine running time to operating time — the more time there is available for production.

⁶The net selling price of paper reached its peak in the 1st quarter of 1989 at \$354.53 per ton. In the 2nd quarter of 1989, 29 months later, the price had fallen to \$236.02 per ton. This has been the longest decline in net selling price since mill operations began. The previous net selling price decline lasted 14 months. Forecasts of net selling price show a recovery starting in the 3rd quarter of 1991. The net selling price will not reach its previous high of \$354 until the 2nd or 3rd quarter of 1993. It will eventually rise to \$445 per ton in the 4th quarter of 1995.

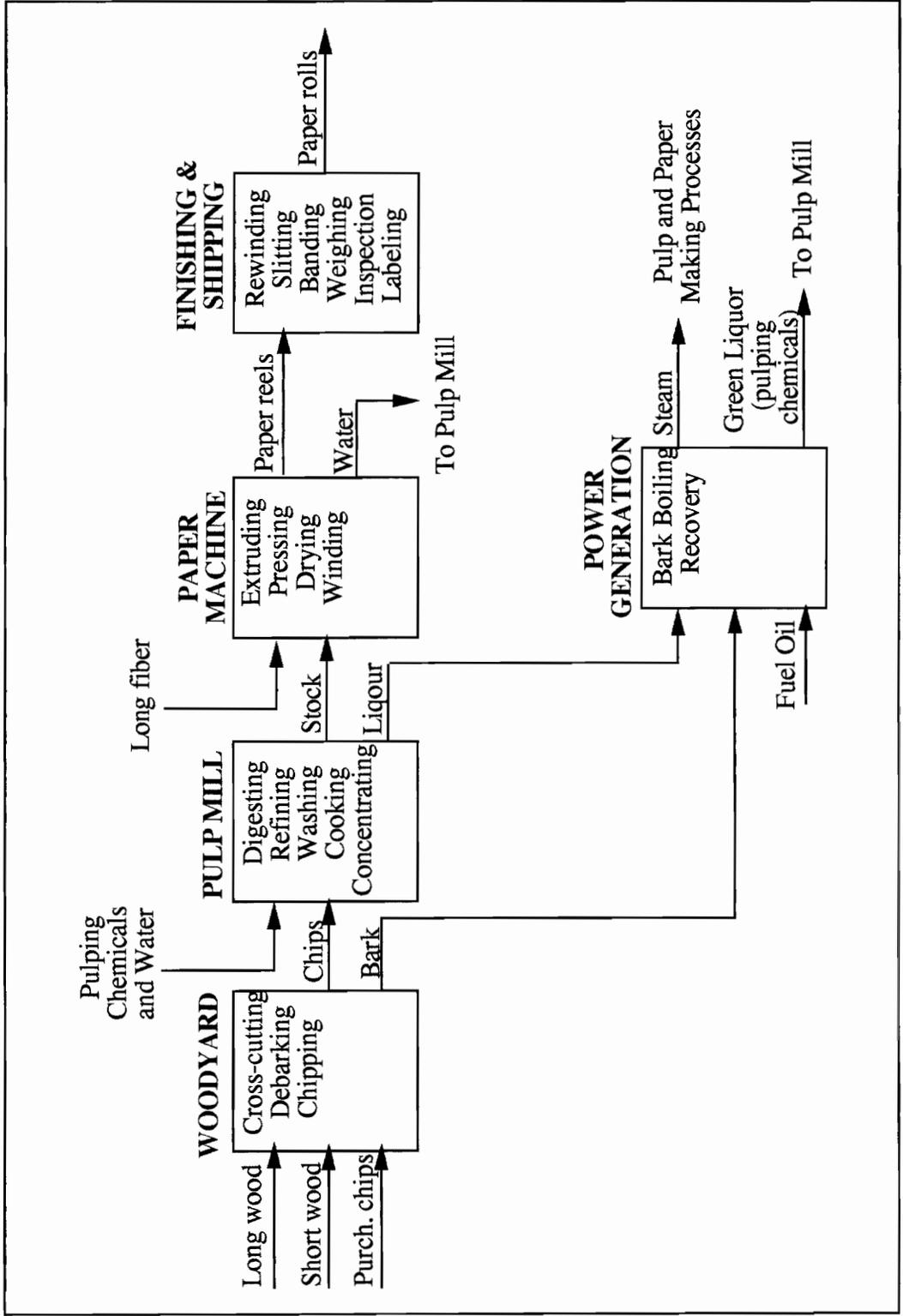


Figure 4-3. A Macro-Level Process Flow Diagram of CP's Production Process

The production rate and lost time, together with production capability, are the three major variables which receive attention by managers, operators, and mechanics. For example, if the maximum production capability is limited to a production rate of 2050 feet per minute, and the paper machine is running at 2050 feet per minute with little if any lost time, the focus is on removing the capability roadblock. If, on the other hand, the paper machine is running at 2000 feet per minute with a lot of downtime, managers, operators, and mechanics are no longer thinking about the capability roadblock. Their focus becomes more operational, shifting toward reducing lost time and increasing the production rate.

4.7 PERFORMANCE

The summary accomplishments table shown in Table 4-1 presents a number of hard performance measures for the past 9 years in the area of production, quality, safety, absenteeism, and pay.⁷

Because CP cannot control the selling price of the product, they do not rely on price recovery to drive profitability. Rather, they practice aggressive cost and productivity management. A review of the accomplishments summary shows that since 1983, production has increased (see Row 2) while labor (Row 14), material (Row 10, 11, and 12) and energy (Row 13) consumption have decreased.⁸ Operational improvements,

⁷To further protect CP's confidentiality, financial performance figures have not been provided Table 4-1. However, a brief financial performance summary is in order. In fiscal year 1991, CP will earn 9% on net sales and 7% on net assets. This is not considered by their top managers as a good year. Return on assets, since the mill started operations, has averaged 5.7%. Return on assets in fiscal year 1987, 1988, 1989, and 1990 has been 18.5%, 23.2%, 25.4%, and 15.2% respectively. Net income in fiscal year 1990 was \$13 million on sales of \$79.6 million.

⁸Figures are not available for capital input. Because of trade-offs among input factors, it could be the case that total productivity has remained unchanged because of capital-labor substitution.

Table 4-1. Major Accomplishments During Fiscal Years 1983-1990

Performance Measures	Unit of Measure	1983	1984	1985	1986	1987	1988	1989	1990
1. Sales	Ton	219,494	221,373	237,371	254,558	264,236	244,602	248,254	262,897
2. Production	Ton	219,548	221,128	238,133	253,973	264,432	244,653	248,745	263,040
3. Avg. Daily Production	Ton	606	614	677	712	725	704	702	721
4. Avg. Mach. Speed (26#)	FPM					1982	1956	1960	2030
5. Operating Days	Day	362	360	352	357	365	348	354	365
6. Scheduled Downtime	Day	3	6	6	8	0	18	11	0
7. Avg. Daily Lost Time	Minute	54	112(A)	124(B)	106	89	127	135	108
8. Machine Efficiency	Percent					93.3	91.2	90.2	92.5
10. Soda Ash Per Ton	Pound	34.5	25.1	21.1	31.8	29.7	34.2	33.4	24.2
11. Caustic Per Ton	Pound	18.2	15.8	14.1	14.4	15.5	15.7	16.8	16.0
12. Fuel Per Ton	MMBTU	8.53	8.56	8.48	8.57	8.1	8.81	8.71	8.91
13. Power Per Ton	KWH	646	651	646	613	620	630	635	643
14. Manhours Per Ton	Hour	1.47	1.49	1.36	1.29	1.25	1.43	1.38	1.36
15. Overtime Worked	%	4.3	5.8	5.7	7.1	5.0	6.9	6.2	5.5
16. Absenteeism	%	1.8	2.0	1.4	2.3	2.2	2.3	2.4	2.9
17. Perfect Attendance	People	90/189	82/186	83/186	73/187	70/188	69/185	63/198	68/198
18. Accidents, Doctor	Case	16	16	18	16	24	27	19	17
19. Accidents, Lost Time	Case	1	1	3	3	2	2	6	7
20. Industry Rank	Safety	3/30	9/29	13/30	12/31	4/33	8/34	9/34	17/31
21. Avg. Bonus Percentages	% of Pay	6.49	17.6	13.2	15.8	17.1	14.1	14.3	16.4
22. Medical Benefits	% of Limit	n.a.	n.a.	69	77	85	104	91	95

Notes:

(A) Includes 127 hours of downtime due to refiner motor outage in December 1983. This amounts to 21 minutes of average daily lost time.

(B) Includes 91 hours of downtime due to a failure of the saveall main shaft in November 1984. This amounts to 16 minutes of daily lost time.

combined with supplier competition, have continually reduced manufacturing costs. Commonwealth Paper has always been able to operate within budgeted costs. Two examples that demonstrate CP's approach to cost reduction are found in the area of clothing costs and chemical costs. Machine clothing is the shortest life piece of equipment on the paper machine, and since last year, there has been an effort to increase clothing (felt) life in order to reduce the number of shutdowns caused by worn felts that need changing. By working with suppliers, felt life has increased to 35 days; originally they lasted fewer than 21 days. The goal for next fiscal year is 42 days. As the felt life has increased, their costs have decreased \$0.50 per ton. In the area of chemical costs, the use of a new, more efficient defoamer, combined with a new supplier, lowered defoamer usage and costs by 27% .

Production for fiscal year 1991 has averaged 740 tons per day, up from 721 tons per day in fiscal year 1990. This 19 ton per day production increase came primarily from controlling lost time (i.e. improving machine efficiency) because the production rate was limited by the paper machine drive. Paper machine efficiency (Table 4-1, Row 8) has continually improved the past three years to 93.5% in fiscal year 1991 from 92.5% in fiscal year 1990 and 90.2% in fiscal year 1989. Downtime for paper machine operations has also improved, down from 6.4% in fiscal year 1989 to 4.7% in fiscal year 1991.⁹ With the installation of the new paper machine drive in July 1991, average paper machine speed (Row 4) has increased to 2125 feet per minute from 2030 feet per minute. The daily production in August 1991 averaged 771 tons per day.

⁹Operations management is still not satisfied with the consistency of mill operations. They continue to have disappointing months and disappointing periods of runnability. Statistical Process Control is being implemented as part of an overall effort to control process variability.

Quality, which has continually improved, is measured by product characteristics like concola and ring crush, and offgrade tonnage. Measurements of concola and ring crush show improvement following the installation of the new stock preparation area and paper machine drive in July 1991. Because CP will not ship any paper that does not meet quality requirements, there is a concerted effort to reduce offgrade tonnage. An analysis of offgrade tonnage revealed that it is mostly produced immediately following an unscheduled start-up. A more stable operation means fewer unscheduled shutdowns and less offgrade tons. Offgrade tonnage has declined to 1,600 tons in fiscal year 1991 from 3,580 tons and 2,550 tons in fiscal year 1990 and 1989 respectively. Fewer offgrade tons means more saleable product.

4.8 PERFORMANCE ISSUES AND PLANS

A review of the assumptions and objectives found in CP's strategic plan shows that CP is focusing on: modernization and expansion, product quality, energy usage and conservation, maintenance, customer base, the performance improvement process, training, environmental, safety, and medical costs.

4.9 MILL MODERNIZATION

A major focus since 1989 has been mill modernization and expansion, a five year plan involving capital expenditures of \$100 million to boost the capacity of the mill to 1,100 tons per day from 700 tons per day. Because CP wishes to remain debt free, this entire modernization project will be financed out of cash flow.

The first phase of the mill modernization and expansion project was the Old Corrugated Container (OCC) plant which allows CP to use recycled fiber. The OCC plant uses recycled boxes to produce pulp for CP's papermaking operation. Since the OCC start up in December 1989, CP has used what they call self-directed work teams to operate the plant.

The second phase of the mill modernization and expansion project was completed in July 1991 when a new stock prep area and a new paper machine drive were installed, allowing for improved quality at a higher paper machine speed. This shutdown, the first in two years, was in the planning stages for 18 months. Scheduled to last for 12 days at a cost of \$15 million, it lasted 13 days at a cost of \$10 million. The shutdown required a great deal of planning and coordination and the use of the largest crane in the Eastern United States (it was brought in on five flatbed trucks and assembled on-site), 450 people on-site from contractors, and all 260 CP employees. Three weeks after the shutdown, the daily production average was 740 tons per day (compared to the pre-shutdown average of 721 tons per day), and daily production records were being set and broken.

The mill modernization and expansion project will continue for the next five to seven years. The cash flow approach to modernization, however, places limits on what can be done. One of the roadblocks to performance improvement cited by top managers in their 1990 Strategic Plan and ranked second overall was conservative owners. Because of conservative owners who wish to remain debt-free, there are insufficient funds to acquire the state-of-the-art equipment available. The downturn in the economy, and the net selling price decline that resulted, has forced CP to modernize and expand somewhat slower than top managers want to. To better integrate capital projects with the business plan, capital projects are prioritized according to their impact: 1) sustain operations - these projects must be done to maintain paper production; 2) risk reduction - these projects should be done to

reduce lost time or improve environmental or safety performance; and 3) return on investment - these are projects that make sense because they will pay for themselves, avoiding problems at some future point in time. These project prioritizations help managers decide what will be done when the total capital project cost exceeds the forecasted cash flow.¹⁰

4.10 PARTICIPATIVE MANAGEMENT PRACTICES

Participation or involvement in performance improvement occurs at two, somewhat distinct levels at CP: formal and informal. At a formal level, there is a participative strategic planning process and an action team process in which top managers, supervisors, engineers, operators, and mechanics work together to design and implement additions to production capability and reductions in lost time. This action team process is one of the types most associated with participative management.

It might appear to an outsider, at first glance, that not much is going on outside this action team process. However, to understand participation at CP, one has to go beyond formal processes. Formal participation at CP has been a more recent development that really began some three years ago with the hiring of the new mill manager. Most of the participation that occurs at CP is informal, occurring in the course of daily operations as

¹⁰It is interesting to note, however, that the cash flow approach to modernization eliminates (or circumvents) a classical management problem: What should money be spent on, and in what priority, when trying to improve organizational performance. In the words of the Mill Manager Bauer, "Somebody may be able to put them (additions to production capability) in order of priority and be accurate on what the sequence should be. But the way that you can be absolutely sure is run until you find the next roadblock. Spend money, move again, and run until you find the next roadblock. Spend money. You do it on a cash flow basis. It's not an unplanned event, although I can't give you the plan right now. But it doesn't matter. I don't have the money to spend on it anyway." With the installation of the new paper machine drive, the winder has become the next speed roadblock.

individuals and groups go beyond formal job descriptions and functions to contribute additional effort. It is this type of informal participation which was designed in from the company's beginnings and from which it probably receives the greatest performance benefits. And, at this stage of CP's formal participation program development, informal participation is more closely connected to the gainsharing program. However, there are plans to forge a stronger linkage between formal participation and the gainsharing program.

The strategic planning process is a fundamental shift in the way CP manages the mill. Commonwealth Paper has always done business planning, forecasting revenues and costs, but had never done performance improvement planning. Beginning in September 1988, CP managers began meeting once a year to lay out strategic objectives (goals to be accomplished in five to seven years) and tactical objectives (goals to be accomplished in the next 12-18 months) that would improve the quality and productivity of the mill.¹¹ They looked at obstacles to CP's future growth and began planning for ways to eliminate them by forming action teams of employees to complete the planning process and implement solutions. The strategic planning process is now in its fourth year. Last year, they worked on 41 tactical objectives, fully implementing 66% , partially completing 17%, and continuing work on 15%.¹²

An action team process is used to support the mill modernization and expansion project. At the present time, 91 employees (34% of the total workforce) had participated on 36 action teams over the past four years. A new initiative is underway to increase the level of participation. Teams are forming around certain operational problems and will receive

¹¹See Sink and Tuttle (1989) for an in-depth description of this planning process.

¹²The researcher's experience with other organizations engaged in similar planning efforts is that this implementation rate is extremely high. Compared to these other organizations, CP focuses more on objectives that are process-oriented, hands-on, and small (incremental versus step-function improvement). They also have "maestros of technology" leading action teams (see Squires, 1986).

training in quality tools to determine a solution.¹³ The way in which the action team process works is best described in the words of Operations Manager Russell:

On our new rebuild of the paper machine we're putting in...a new stock preparation area. We'll use some of the old equipment, but basically it's all new additional equipment...Well, several years ago we had commissioned an engineering consulting firm to do a study of this mill and come back with recommendations to raise the production level of this mill from 700 tons per day to 1000 tons per day. So they did that. And that is a base document. Then we identified the stock prep project. We said, "Okay. We're going to do this...and we want to utilize the people in the mill to...help modernize the mill." So the department manager for the paper machine area...is the chair for that action committee. He now says, "Okay. I want an engineer to help me." If it's electrical type, he wants an electrical engineer. He goes to John (the maintenance manager) and says, "I want the paper machine maintenance foreman and I want your electrical maintenance foreman on my action team." And he goes out here to the operating people and says, "All right. Call either Matt or a certain crew and I'd like to have you join my action team to put in a new stock prep."...So he forms a little team to design and engineer a stock preparation area for expansion of this mill. He can use a consultant if he wants too...And so he starts with that team and says, "Okay, we want to do this and that, and we want to be able to handle 1000 tons a day."...Maybe they decide to go look at other mills that put in a stock preparation area or go look at suppliers of equipment. They can talk to engineering firms that they might want to do the engineering...That team goes through a step-by-step process that has been set up by us...and then make their recommendations to what we call a management action team...The management action team is the management level for the departments involved. And as they go through this process they want money. They want money to make a trip. They want money to commission a certain part of the work. So as they go through this process, there comes a time to...review what they have come up with. "This is our plan for a stock preparation area. You commissioned us to do this. You wanted us to come up with some plans for stock preparation." And that's reviewed and then a capital

¹³Commonwealth Paper takes a different approach to training than most organizations: operational problems drive training programs, not the reverse. Training is targeted to help people solve the problems faced.

purchase release is issued; funds for the \$3 million or whatever it is to do the job. The action team is responsible for training all in-house people, from maintenance to the operations guy... to make sure we can do this and do that...That's how we get our projects instead of saying, "Red Engineering, we want 1000 tons a day."...CP's formula or method of improving this mill is through action teams...Action teams can be done in other areas, every department, every phase of this mill expansion. Whether it's the woodyard or whatever...a team has been formed. They may be dormant now but they have done something. They know what lies ahead and soon as funds become available, because we're expanding the mill on a cash flow basis, they'll become active.

The benefits of the action team approach are seen in the July shutdown: although the shutdown lasted one day longer than planned (because of some unexpected maintenance work), it was \$5 million under budget. Three weeks after the shutdown, production records were being set.

The action team process is not the only participative initiative occurring at the mill; self-directed work teams operate the Old Corrugated Container plant (see Van Aiken, 1991). Everyone on the team has the same job classification and can perform all the team's tasks. Teams work either three or four shifts in a week. Three team members work days at any one time, from 6:30 a.m. to 6:30 p.m., and one team member works overnight to do preventive maintenance, lubrication, unload trucks, inventory control, and fire watch. Team members rotate the job or working overnight. There are three basic jobs for the three team members working days: (1) monitoring controls, (2) working on the floor, and (3) feeding bales. Team members rotate these three jobs every three to four hours. Some of the specific decisions and responsibilities of teams are:

- Scheduling work and the rotating jobs;
- Keeping time cards;
- Entering quality information on incoming materials;

- Monitoring and adjusting process parameters;
- Performing 70-80% of minor maintenance;
- Shutting down the mill if necessary;
- Calling maintenance to fix a problem;
- Deciding whether to work overtime;
- Receiving information on in-coming shipments;
- Deciding to bring in someone from the labor pool if necessary;
- Managing inventory;
- Ordering things (up to a certain point);
- Determining and addressing training needs;
- Covering for the supervisor if she or he is out;
- Responding to questions from other parts of the mill;
- Responding to technical questions from people outside the mill;
- Trying new things, providing ideas to engineering; and
- Informally evaluating new team members.

In addition to the self-directed teams, there is also a committee structure that provides a system of “checks and balances” on policy decisions to ensure that policy decisions are fair to all parties. There is a President’s Operating Committee, an Employee Relations Committee, and a Safety Committee.

Commonwealth Paper is trying to foster a participative environment throughout the mill, to supplement past participative initiatives in the past (quality circles, employees deciding to work twelve hour shifts). With plans to move the participative strategic planning process to all levels of the organization, even more employees will have the opportunity for involvement in quality and productivity improvement.

4.11 INFORMATION SHARING PRACTICES

An outsider is not skeptical when top managers talk about there being “no secrets” at CP, because more performance information than one would ever expect — including financial performance — is volunteered to outsiders.¹⁴ Top managers claim that if they are guilty of anything, it is sharing too much information. Because sharing information, according to President Allen, has “always been the rule,” they have always shared financial information and wanted employees to know “the way it is” and that there are not “two sets of books.”

Table 4-2 shows the information provided to employees working in the Old Corrugated Container plant. This information is typical of the type of information provided all CP employees: feedback on performance, production information, team issues, technical information, internal customer feedback, CP issues, and CP performance. Two information sharing mechanisms in particular — the Weekly Operations Report and Semi-Annual Communication Meetings — demonstrate CP’s commitment to information sharing.

A weekly operations report that contains summaries, by department, on the prior week’s operations, including activities, problems, and safety issues is sent to all departments and is posted on bulletin boards. In addition, all employees have access to any and all information on the computer system. If they have a question, they can look up the answer in the computer system, and if they can’t find a satisfactory answer there, they can ask any supervisor, manager, or the president. Because of the wealth of information available to employees, the rumor mill is not the primary source of information.

¹⁴This section is heavily based on Van Aiken’s (1991) case study of information sharing practices at CP in the Old Corrugated Container plant.

Table 4-2. Information Shared with CP Employees (Source: Van Aiken, 1991)

Information Shared	Examples
Team Performance	Informal recognition, written memos
Process Information	Process parameters, incoming material, internal customer demand
Team Issues	Equipment problems, job assignments
Product Changes	Operating procedure changes
Customer Feedback	Internal customer problems
Company Issues	Upcoming projects, mill problems, project statuses, production forecasts, training schedules, human interest stories, strategic and tactical plans, pay and benefits
Company Perform.	Department performance, production and operating statistics (lost time, machine speed, product quality), safety, average daily production tonnage, customer complaints, defects, financial performance

Semi-annual communications meetings in April and September keep all employees informed on company performance and upcoming plans. The meetings used to be quarterly but were cut back twice a year because employees thought they happened too much. There are several meetings each time so all employees can attend. The typical agenda for the meeting is:

1. Comments from President Allen - perceptions of overall business climate, mill performance, an update on the strategic planning process, and any other topics he believes important to discuss;
2. Sales and Marketing Report - the marketplace, strength of customer orders, net selling price situation, and new and lost opportunities;
3. Financial Report - financial performance review;
4. Operations Report - the status of production operations, ongoing and planned projects, quality indicators, and other relevant production information.
5. Miscellaneous - planned shutdowns, safety, training, and environmental issues;
6. Questions and Concerns - any questions or concerns someone may have.

There is also an annual address to employees in September, the end of the fiscal year; this annual address differs from the communications meeting because there is much more detail shared about performance, projects and plans in various areas, and annual pay raises. The Annual Report to Employees, a comprehensive, detailed compilation of how CP performed, is a summary of this annual address. The major sections of this report are:

1. Strategic Planning - update of progress toward strategic objectives and tactical objectives;
2. Performance - significant accomplishments, net income, return on assets, cost comparison to other mills, daily production and lost time, monthly average production, and paper machine lost time;
3. Market - net selling price;
4. Safety - safety performance and accidents, listed by type;
5. Attendance - percent absenteeism, absenteeism costs, employees with perfect attendance;
6. Wages - cost of pay and benefits, typical earnings, comparison with other mills;
7. Benefits - medical benefits, medical costs, comparison with other mills;
8. Incentive Program - incentive plan performance;
9. Training;
10. Charitable Contributions;
11. Guiding Principles - mission, vision, and the Principles of the Partnership; and
12. Service Anniversaries

4.12 WORKFORCE CHARACTERISTICS

A thumbnail sketch of the typical CP employee is a white male, age 43, with a high school education, living in a rural county, with 10 to 14 years of vested service. Almost 62 percent of employees are ages 35-49, 70 percent of employees have a high school education or some college, and 69 percent of employees have 10 years or more seniority. Females comprise 15.8 percent of the workforce and minorities comprise 10.5 percent.

Kiser (1989) had the opportunity to conduct a number of sessions with top managers, supervisors, operators and mechanics, and clerical and administration, for the purpose of identifying roadblocks to performance improvement. His findings lend some insight to the characteristics of these groups. Top managers, particularly on the operations side, are engineers that understand the paper production process. The overwhelming majority of top managers appear to be genuinely interested and committed to a continuous improvement philosophy in several key areas:

- 1) improving the paper-making process in both quantity and quality;
- 2) responding to the needs and expectations of customers;
- 3) making prudent capital investment decisions; and
- 4) wanting to create and reinforce a culture that is characterized by fairness, openness, and involvement.

By the same token, top managers in no way minimized some of the internal and external challenges facing CP. For example, there was a strong consensus that the mill must improve operational processes, and that while capital investment is a must, the conservative ownership of the company hindered this. In addition, there are a number of “people” issues — compensation, benefits, training, and employee involvement in performance

improvement — that continually require their attention and action. Kiser (1991) believes this picture of top management is still valid today.

Supervisors are more concerned with people issues than process issues like equipment and maintenance. Most of their performance roadblocks involve problems with communication, performance appraisal, powerlessness, micro-management, and the absence of long-term planning. Kiser (1989) suggests that this pattern is not unique to supervisors and staff at CP. Other studies suggest that supervisors feel themselves “caught in the crossfire” between top management and employees. A typical reaction is a feeling of frustration in trying to please those above them and effectively supervising and managing those below them. Kiser found that perceptions of poor communication and powerlessness were being influenced by a subset of top managers who did not always communicate effectively with supervisors or who believed only in one-way communication. Since Kiser’s study, a weekly communications meeting with supervisors has been established, and the planning process is being implemented at the supervisor level.

At the operator and mechanic level, and clerical and administrative level, Kiser (1989) found roadblocks that were very predictable and other roadblocks that surprised him. His experience has been that when non-exempt employees are asked to list roadblocks to doing their job, they will more often than not list those things that directly and personally affect them on a day-to-day basis. Things such as pay and benefits, working conditions, attitude and behavioral style of management, and supervisors are almost always listed. In addition, lack of opportunity for advancement and lack of training are frequently mentioned. In this respect, employees at CP did not disappoint him when they were asked to list roadblocks.

While Kiser expected many of the roadblocks mentioned by employees, he was surprised and impressed with the number of roadblocks that were operational in nature.

That is, there were things that employees wanted to change in order to do a better job and make a better product. Several groups mentioned problems with machinery and maintenance of that machinery, and while such problems might be interpreted as self-serving in nature, Kiser was convinced that a majority of these employees were committed to improving the production process. Granted, their time frame for improving the process was shorter and more tactical than top managements', but their commitment to continuous improvement was not markedly lower. Van Aiken (1991) came to a similar conclusion in her study of CP's self-directed teams.

4.13 CULTURE

Because culture is an ongoing process, not a simple variable that an organization possesses, it is difficult to describe.¹⁵ While many characteristics of culture rest in the obvious, many more rest in the mundane. The "Principles of the Partnership" shown in Figure 4-1 provide, in a sense, the design specifications for CP's culture. The importance of culture to CP's performance was highlighted by President Allen while discussing strategic planning:

Our ability to implement strategic planning, take those strategic objectives and break them down into tactical objectives, then pass that information to the troops and put together action teams to address these tactical objectives would not work nearly as smoothly today if not for the principles and culture we developed over the first ten year's

¹⁵While culture is difficult to describe, it is probably even more difficult to manage and control. As Morgan (1986) points out, to manage and control culture in the sense that many management writers advocate assumes that culture can be manipulated in an instrumental way. This mechanistic view of culture ignores an important, defining property of culture: it pervades organizational life in a way that is not amendable to direct control by any one or any group. President Allen readily admits that he does not know exactly how the culture at CP evolved. Some of it was planned. Most of it was luck.

of the company's life. Our planning efforts would have failed if we hadn't, at the outset, said, "We want a company that's different, where everybody's equal. We want one where everybody's respected. We want a company where there are no boundaries on what a person can do, where a person can become anything he wants to as long as he applies himself. We want a very open company with no secrets between management and the people in the lines of progression.

Following are some critical elements of CP's culture:

Element 1 - Practice ethical management. Four stories illustrate the ethical code guiding CP managers. Mill Manager Bauer, was asked why there was a proposed reorganization. He said that there were a few people, three to five years away from retirement, who were no longer making the contribution they should, and he would like to get their replacements in place now in order to take over when these senior people retire. When asked whether it was good to keep people on the payroll if they were no longer contributing, he said, "I don't know whether it's good or bad, but they've been with us since the beginning. It's the right thing to do."

Clint Brown — the pulp, power, and woodyard manager — wrote personal checks to three employees, totalling over \$1,100 because his error, and the supervisor's error, meant that these employees would not get this money at the time they were expecting it, but sometime afterwards. When they got their checks later down the line in time, they just signed it and gave it to him.

At the end of the 3rd Annual Strategic Planning Session, top managers were shown the findings of a research study that asked the question, "Does fairness make a difference?"¹⁶ The research study identified a number of factors that influence feelings of fairness: openness, trust, respect, influence, consistency, equity, justice, and integrity.

¹⁶See Sashkin and Williams (1990).

Bob Loudon, the engineering manager, asked, "How long did it take this guy to figure this out? These are some very basic, fundamental principles on how you should treat people." A construction manager from an engineering consulting firm, with 30 years experience in the paper industry, told me that "he couldn't be a manager at Commonwealth Paper. They worry too much about people."

Tim Scharr, the guest house manager, was diagnosed as having cancer. His treatment required long stays away from home. Commonwealth Paper flew him and his family to the treatment site and paid for their stay.

Element 2 - Tons, tons, tons. Because CP is small in comparison to its competitors, it cannot do much to influence the net selling price of the product. While they do an excellent job of forecasting net selling price and are concerned about it, they don't rely on selling price for profits. Rather, they worry more about what they can do. That is, they continually strive to reduce their costs per ton and improve productivity. As President Allen put it, "The only way we can help ourselves is tons, tons, tons."

Element 3 - Think in minutes. The hours will take care of themselves. Maintenance Manager Daniels summed up this type of thinking when he said:

You've got...six paper machine breaks in one day. Two minutes for a break is 12 minutes a day. Like I say, five days like that and you have already lost a ton of paper...I think you have to look at minutes more so than hours if you're trying to make the tons.

The minute mentality is, however, balanced by a strategic planning effort with a vision for the year 2000, a five to seven year mill modernization plan, five to seven year strategic objectives, and 12-18 month tactical objectives.

Element 4 - Continuously improve. As mentioned in the previous section on workforce characteristics, the overwhelming majority of top managers appear to be

genuinely interested and committed to a continuous improvement philosophy in several key areas: 1) improving the paper-making process in both quantity and quality; 2) responding to the needs and expectations of customers; 3) making prudent capital investment decisions; and 4) wanting to create and reinforce a culture that is characterized by fairness, openness, and involvement. In addition, the majority of employees are committed to improving the production process. Their time frame for improving the process is shorter and more tactical than top management's, but their commitment to continuous improvement is not markedly lower.

Element 5 - Think about your customer. Top managers believe an important part of their job is to protect the people who work for them from bureaucracy. President Allen, for example, looks at the organization as upside-down, with himself and other management there to support employees (Van Aiken, 1991). The president, in his words, is “at the bottom and up at the top you have a broad base of individuals that are out there in the trenches making the decisions...I don't want to get in their way, I just want to support them” and provide “the capital, so to speak, for them to get the job done.”

Element 6 - Use science and common sense. There is nothing fancy in what CP does. It is good scientific management: they perform test trials, conduct process experiments, and describe before they prescribe. They are methodical in both planning and implementation; CP does things because they simply make sense, like self-directing teams in their Old Corrugated Container plant and strategic performance improvement planning.

Element 7 - No secrets. One gets the feeling of openness when first arriving at CP. You are given the key to the guest house; you are allowed to see financial statements; and one gets the sense this is not superficial openness. That is, it is not public openness designed to subsume private discontent. You are privy to dialogue on sensitive issues. I witnessed more than a few disagreements among managers. A project engineer and

construction manager from an engineering consulting firm, with 20 and 30 years experience in the paper industry respectively, called working on projects at CP “a joy” because everyone knows what is going on and everyone is willing to talk about the project.

Element 8 - Above and beyond. Hardin (1985) identified an intrinsic defect of organizations which he called the defect of delegation: it is easier to meet the job requirements than it is to do the job right. This defect increases with organizational size and size-related feelings of impersonality. Commonwealth Paper’s goal, in the words of Human Resource Manager Hutchinson, is to “not carry one more body than is absolutely necessary,” and because of this lean staffing, performance expectations are high. Since there are not “layers upon layers of employees,” there is a feeling that one can contribute and make a difference.

Element 9 - Hire people that “fit.” Recently, there were 170 applicants for an instrument technician position; 18 were interviewed, and one was hired. Managers at CP view the hiring decision as the most critical decision they make. The attention given to selection and placement helps ensure a “critical mass” of managers and employees are not only of high quality but philosophically aligned with the culture. When talking with top managers about people, the word “fit” is often used, people who “fit our culture.” As President Allen explained:

We try to apply the same standards to everyone we hire. The one thing we look for is a person that will fit the culture that we have here. That’s the number one judgment before we even look at the individual’s technical abilities. We have to ask ourselves, “Does his personality, his nature, his way of operating and beliefs fit our culture?” If the answer is no, then I don’t want to know anything else about him. It’s easy to find guys that just come in and dictate how the job is to be done. Those are easy to find. Thousands of them. It’s hard to find an individual who will take the time to be a team player, to allow people to participate, take the time to communicate.

He went on to add,

I would just sum it up by saying this: The key to having an organization with the culture that we have here and have it function and operate like it does today, you start with recruiting. That's very important. It starts with recruiting, and that's at all levels, from the janitor to the president. Because every one of those positions are people who are important when it comes to attitude, belief, and how you work with other people, how you treat other people, and how you conduct your business with other people.

It is here, in hiring decisions, that one sees the difference between “being” (i.e. a person's moral and ethical character) and “doing” (i.e. a person's skills and abilities).

President Allen revealed the importance of this distinction when asked the type of skills he wants his top managers to possess:

You can buy professional credentials but the other part of it is human. You are born with it or your parents instill it in you the way you were brought up. I don't know where it comes from. Some people have it and some people don't. Just like the (former mill manager) said, “I understand what you are trying to do. I know you want us to interface with people, how you want us to be, but I just can't do it. It's not my nature to do things that way.”

Element 10 - Give something back to others. Commonwealth Paper contributes ten percent of its pretax profits to charity, continuing a pledge established in 1988. Nine percent of pretax profits went to a worldwide relief organization founded by Chairman Neal. One percent of the profits are designated for local charities. Employees were able to designate where many of these local contributions went through the company's matching funds program. Others went to support local rescue squads, fire departments, educational institutions, hospitals and free clinics, museums and the arts. There is also an aggressive

environmental program being organized and a partnership being formed with the local Board of Education. Employees have begun their own charitable contributions program, HAND, or the Help A Neighbor Donations Program, which seeks to raise money from employees for the less fortunate in the area. Donations have been used to help a local family whose home was destroyed by fire and to assist the Salvation Army in its Christmas Gift Program for needy children. HAND has placed donation boxes in five areas of the mill to make donating convenient.

4.14 PAY, BENEFITS, AND THE GAINSHARING PROGRAM

Since its founding, CP has worked to create the feeling of togetherness, that this organization is truly a partnership. Their pay practices are, perhaps, with the exception of information sharing, the most visible symbols of this partnership. Everyone at CP is paid according to the same job evaluation plan; there is no separate plan for hourly employees, salary employees, and top managers. Everyone participates in the incentive bonus plan and everyone receives the same benefits.

Commonwealth Paper takes a lag strategy in regards to base pay. It considers what comparison mills are paying different jobs, considers the increases in pay for those jobs, and adjusts base pay and premium pay accordingly. Because base pay has begun to stagnate in the paper industry, as unionized mills look for ways to control costs, base pay at CP has also begun to level off. Total earnings (base pay, premium pay, lump sum payments, incentive bonus, and benefits) in 1991, however, were 14.3% higher than the average of six similar mills. The average employee, doing the same job today as in 1976, has gained 7.8% in real purchasing power.

Medical benefits is the major pay issue now confronting CP. Of the six mills they compare themselves to, they are the only one providing both basic and comprehensive medical coverage at no cost to employees. However, medical costs continue to rise (see Table 4-1, Row 22). A management action team, formed last year, is working to slow, stop, or reverse this trend. In the meantime, they are keeping everyone informed of medical costs and the possibility that one day employee contributions to medical may become necessary.

The gainsharing program, or incentive program as it is often referred to at CP, is, according to Human Resource Manager Hutchinson, the “cornerstone of the pay package and Commonwealth Paper.” To him, “Commonwealth Paper in a nutshell” is,

If you get a bunch of people and you put them in a good work environment with no union and give them an opportunity to participate, pay them well, give them benefits to protect them and their families against major peril such as death and disability and give them the opportunity to earn more (the incentive program), they are going to work hard and feel ownership in the process.

Because the incentive program was the focus of this research, more will be said about the incentive program in the next chapter. However, it is worthwhile here to briefly review its design, bonus history, and the changes made to it over the years.

The original incentive program design is found Figure 4-4. The design is fairly simple and straightforward: the incentive bonus percentage is determined each month by comparing the average daily salable tonnage produced (based on actual operating days) to the incentive compensation schedule (which pairs production tonnage with a bonus percent). The incentive bonus percentage is applied to earnings for actual hours worked, including scheduled holidays and vacation days. The payment of the incentive bonus is paid quarterly for the preceding three months, in January, April, July, and October. All

EMPLOYEE INCENTIVE PLAN

1. Eligibility: All permanent Commonwealth Paper employees on the payroll the first and last day of each calendar quarter.
2. Production Goals: Production goals will be developed annually by management on the basis of mill capability.
3. Incentive Percentage: The incentive percentage will be applied to earnings for actual hours worked including scheduled holidays and vacation days.
4. Production goals and incentive percentage for the Calendar Year 1976:

<u>Average Daily Salable Tonnage Production Per Month</u>		<u>Incentive Percentages</u>
<u>At Least</u>	<u>But Less Than</u>	
400	410	1
410	420	2
420	430	3
430	440	4
440	450	5
450	460	6
460	470	7
470	480	8
480	490	9
490	500	10
500	510	11
510	520	12

Average daily salable tonnage production per month will be calculated on the basis of actual operating days (excluding downtime scheduled by Management).

5. Incentive Calculation: Incentive percentage will be determined each month by comparing the average daily salable production tonnage produced as reported in the Company's Financial Statements to the Incentive Production Goal/Incentive Percentage table. The incentive percent attained will be applied to eligible earnings for all full weeks in the month plus any week where the majority of the days in the week fall within the incentive month.
6. Payment of Incentive: Payment of incentive compensation earned will be by company check issued in January, April, July and October for the preceding three months.

Figure 4-4. Commonwealth Paper's Original Gainsharing Program Design

permanent CP employees on the payroll the first and last day of each calendar quarter are eligible.

Incentive compensation has become a significant portion of total compensation, rising from 1.75% in 1976 to an average 18.4% the first seven months of fiscal 1991 (see Table 4-1, Row 21). The incentive program has paid out more than \$16 million since it was introduced. Incentive was earned and paid even during the financially uncertain years leading up to 1979, before CP became profitable.

Since its introduction, there have been three actual adjustments to the incentive base, one in each year 1977, 1981, and 1985 (Table 4-3). These adjustments were made at the conclusion of a *trial period* following major capital improvements to increase production.¹⁷ A fourth trial period was to have occurred following the installation of a new headbox, computer slice control and top former in December 1987. However, post installation production dropped and remained below pre-installation levels for over two

Table 4-3. Previous Test Periods and Resulting Adjustments to the Incentive Base

Adjustment Date	Base Ton. Prior to Mill Modern.	Tonnage After Trial Period	Production Tonnage Increase	Incentive Base Adjustment	Capacity Creep After Trial Period
8/1/77	525	543	18	20	37
5/1/81	580	612	32	28	18
4/1/85	630	766	136	112	9
10/1/91	775	793	18		

¹⁷The original memo that details the incentive program called for the incentive base to be adjusted annually, based on production capacity. This was, however, not done until this year. It will become standard practice because of the problem of tonnage creep (or capacity creep) associated with trial periods (see Table 4-3). Trial periods have posed a problem for CP in the past because the trial periods are shorter than the learning curve of the new equipment and no one can predict the learning curve of new equipment.

years. Then, production rebounded and surpassed levels achieved prior to the December 1987 shutdown.¹⁸ Therefore, a fourth adjustment has taken place for fiscal year 1992 that takes into account the postponed trial period for the December 1987 shutdown and installation of the new stock prep area and paper machine drive in July 1991 Table 4-4 compares the proposed and current incentive schedule.

¹⁸The production rebound resulted in a 2.5% increase in incentive bonus from pre-installation levels. The story behind the production increase, as told by President Allen, is interesting and worth recounting: When we started up after that shutdown, production dropped about 25 tons a day. From like 723 to 690 or 700, and it stayed there for two-and-a-half years. And we said, "What in the hell is happening?" We spent all this money to give you (employees) better equipment and we aren't getting anything out of it. But during that two-and-a-half years, we had an awful lot of breaks on the paper machine...and they kept complaining we don't have enough vacuum...to drain the water out and get it ready to go into the presses...We said, "well maybe we ought to replace the vacuum pumps..We'll replace those. Maybe something is wrong with them." And then Wade, the young engineer we sent down to maintenance...said, "Let me go out there and study those pumps. Monitor them for several days before we do that. So he goes down and he's not down there for a hour or so and he comes back and said, "I think I know what the problem is...I think the screens in the vacuum line that the contractor put in back in December of 87 to catch slag, and bolts, and nuts, and wrenches that fall down in the equipment while you are working on it, from going in the vacuum pumps and destroying parts, I think those screens are still in there."...So he goes down there and we break the line. Sure enough, there is a screen just packed full of junk...Been there since December of 87.

Table 4-4. The Current and Proposed Incentive Schedule

<u>Monthly Average Tons Per Day</u>	<u>Current Incentive Schedule Percentage</u>	<u>Proposed Incentive Schedule Percentage</u>
650	10	
655		1
660	11	2
665		3
670	12	4
675		5
680	13	6
685		7
690	14	8
695		9
700	15	10
705		11
710	16	12
715		13
720	17	14
725		15
730	18	16
735		17
740 (Budgeted Tons)	19	18
745		19
750	20	20
755		21
760	21	22
765		23
770	22	24
775		25
780	23	26

5.0 A MODEL OF HOW GAINSHARING AFFECTS PERFORMANCE AT COMMONWEALTH PAPER

The model that follows is comprised of six sectors: 1) Paper Production; 2) Financial Performance; 3) Compensation; 4) Participation; 5) Information Sharing; and (6) Incentive Bonus. These model sectors emerged through a grounded (i.e., data based), circular process of listening to interview tapes, reviewing field notes and interview transcripts, referencing secondary data sources, and attempting to reach closure by visually portraying variables and relationships. It was originally thought there would be four sectors: 1) a participation sector, 2) an information sharing sector, 3) an incentive sector, and 4) a performance impact sector. While the data could have fit the original four sectors, it made more sense to split the incentive bonus sector into two parts — incentive bonus and compensation —because of Commonwealth Paper’s (CP) emphasis on total compensation, and to include a sector on financial performance because it determines CP’s ability to pay an incentive bonus. The paper production sector closely resembles the original concept of a performance impact sector, but performance measures are found in most of the other sectors. Because the sectors are interrelated and blend together, there were no hard and fast rules in deciding which variables and relationships comprise one sector and which comprise another. One could argue about the variables and relationships that comprise each sector, why they are in one and not another, or why there are not two or eight or twenty sectors. Again, these six sectors are not necessarily “the sectors” but rather a conceptual framework that made sense, based on the researcher’s interpretation of the data; these

provided an avenue for organizing and portraying how gainsharing works to affect performance at CP.

While the names and number of model sectors changed from what was originally thought, the more important change was in the system structure of the model sectors themselves. It was originally thought that the model sectors — with the exception of the performance impact sectors (in this case paper production and financial performance) — would follow what is commonly referred to as a “limits to growth” structure (see Appendix C, page 263). Limits to growth structures tend to be present in most organizational improvement programs and often frustrate organizational changes that seem to be gaining ground at first and then run out of steam (see Senge, 1990). While there are limits present in each of the model sectors, it appears that the model follows a system structure known as an “eroding goal” structure (see Senge, 1990); in this system structure, a gap between actual performance and a performance goal creates pressure to improve performance and lower the performance goal (hence the name, eroding goal). The limits to growth structure may not be present in the gainsharing program at CP because it was, unlike most other gainsharing programs or most other organizational improvement programs, designed into the organization from the very beginning. More will be said about both these system structures in Chapter Six.

The description of how gainsharing works to affect performance at CP begins with a description of the paper production sector. (The narrative that describes each sector and the causal diagram that depicts the variables and relationships in each sector are simply different ways to portray the same phenomenon. The narrative is the verbal model, and the causal diagram is the visual model.) It is here that most of the effects influenced by the gainsharing program manifest themselves. Next, the financial performance sector is described because it ties in closely with paper production. Paper production is, after all,

CP's business — generating revenue and producing cost. Following the financial performance sector is a description of the compensation sector. The compensation sector produces a key effect found in the paper production sector: labor-management partnership (or conversely, labor-management polarization). A description of the participation sector come next. One of this sector's main effects is reducing the delay between improvement projects and performance results. That is, participation helps CP move down the learning curve faster when implementing new equipment or procedures. A description of the information sharing sector is next. The effects produced by this sector are considered by top managers at CP to be as important as the effects produced by the incentive bonus sector, whose description appears last. The reason for describing the incentive bonus sector last is to place it in its proper context. With a working knowledge of the first five sectors, one can begin to see how the incentive program interacts with the causes and effects found in the other sectors.

5.1 THE PAPER PRODUCTION SECTOR

Paper production is so important to the success of CP that one cannot spend a day with its top managers and not learn more than expected or bargained for about making paper. Because CP is small in comparison to its competitors, it cannot control the selling price of its product — which has declined by almost 30 percent the past two years — making cost control and production critical not only to profitability but to survival of the company itself. There is a widespread belief among top managers at CP that if they can, in the words of President Allen, get quality “tons out the door, everything else will fall in place.” Therefore, it is appropriate to begin a description of how gainsharing works to affect performance at CP with a description of the variables and relationships that influence

paper machine production. Most everything at CP, including the gainsharing program, seems to be geared toward that end.

Paper production is a capital intensive, continuous process operation (those readers who are unfamiliar with the paper production process may wish to read the brief description found in Section 4.6). The rate at which paper can be produced, and the amount of time paper is being produced, are the key determinants for production performance, as measured in tons. With each increase in the production rate, more tons can be produced per unit of time. And, with each percentage increase in machine efficiency — the ratio of uptime or paper machine running time to operating time — the more time there is for production. Figure 5-1 portrays the variables and relationships that influence the paper machine production rate (Quadrant II, lower left) and those that influence paper machine efficiency (Quadrant I). A discussion of Figure 5-1 follows.

5.1.1 THE PAPER MACHINE PRODUCTION RATE

The paper machine production rate (Figure 5-1, Quadrant II, lower left) is influenced by product characteristics (Quadrant I, lower right), production effort (Quadrant II, lower left), and production capability (Quadrant II, upper right). Product characteristics, like weight, and quality requirements like concore and ring crush, are mostly determined by the marketplace. Production-focused effort, on the other hand, is mostly determined by managers, operators, and mechanics. Managers, operators, and mechanics come to CP each day with a finite amount of energy. That energy can be spent either on value-adding activity or wasted on non-value-adding activity. The more physical or mental energy of the total energy available that is directed toward a value-added activity, like increasing the production rate, the better. Work rule restrictions (Quadrant III, upper

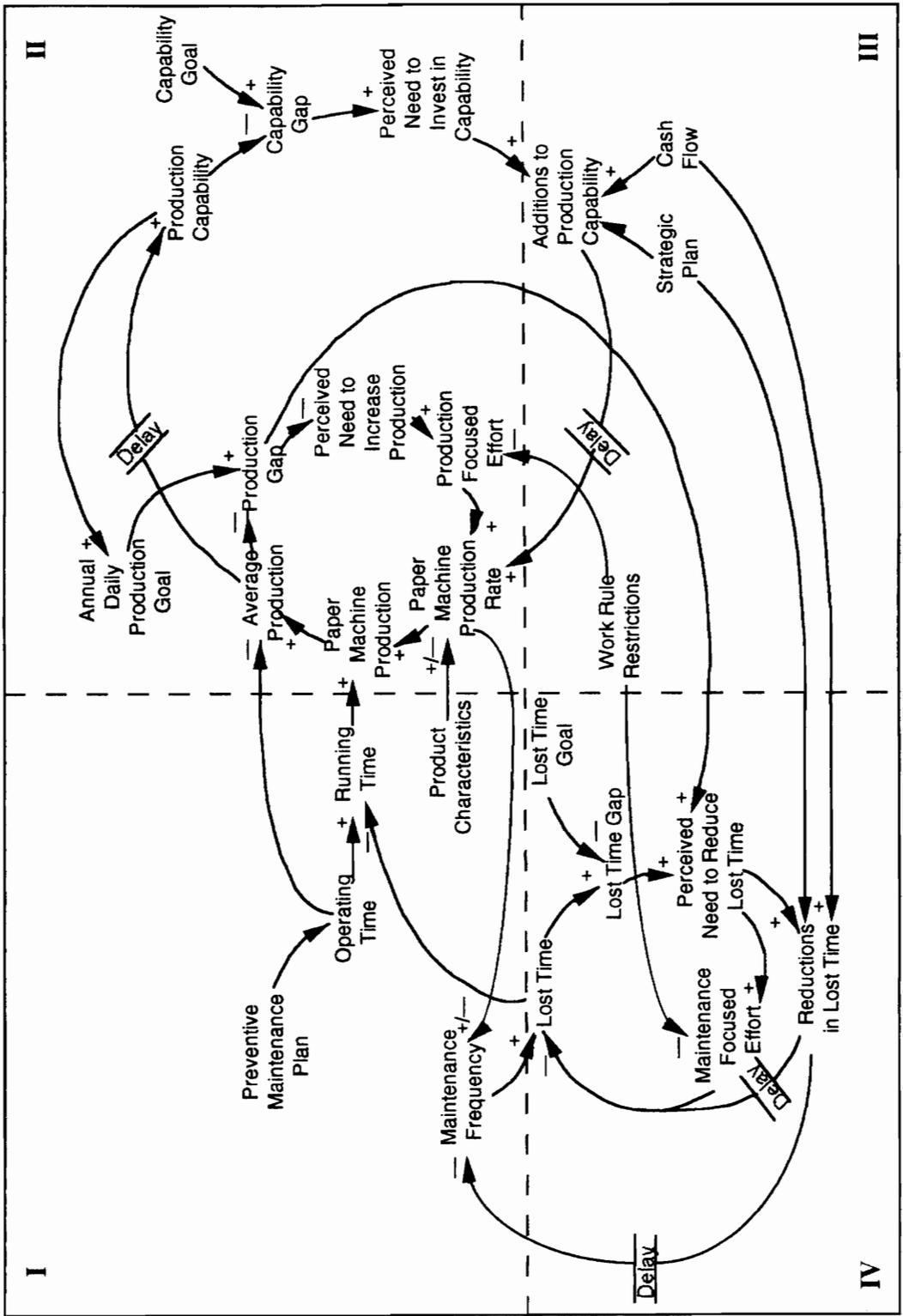


Figure 5-1. The Production Sector

right) place limits on the total amount of production-focused (and maintenance-focused) effort. There is a belief among top managers, several of whom have worked in union mills, that the non-union environment at CP makes a difference in their ability to get things done because there are few work restrictions with which they have to contend. More will be said about the effects of work rule restrictions on production-focused and maintenance-focused effort in Section 5.3.

Top managers at CP talk about the concern for, sensitivity to, and focus on production that influences the overall level of production effort. The following quotes by President Allen, Mill Manager Bauer, Operations Manager Russell, and Financial Manager Kohler, respectively, were typical of the statements emerging during the interviews:

President Allen: With their efforts and their teamwork, their attitudes, their presence, their dedication can and will have an impact on production.

Mill Manager Bauer: This is the only mill that you go into...in which the mechanics, the operating people, the pulp mill, the shipping department, or the woodyard, or the secretaries care anything about the production of the mill. I guarantee you that... And even though the accountant may not be able to come down here and pick up a tool and help us fix something, he is genuinely concerned. And he's more understanding if he knows the operators and their management are preoccupied with the condition of the paper machine. "Hey, I need something, but I will wait until you get the paper machine fixed." There's the sensitivity we talked about.

Operations Manager Russell: You come in here...Monday morning after a bad weekend, and people want to know why, what happened. Why did we make 650 tons? You go to other places and make 650, no big deal. And I can give you an estimate because I was talking with some people in New Orleans in February at a seminar...You go out in those other mills and...you've got the chance to speed up the paper machine 25 feet. The operator says, "No. Why should I do that? It makes more work for me." You take a man out here at Commonwealth Paper and we don't tell people here to speed up. They know.

Finance Manager Kohler: I think our people work hard but people work hard everywhere. Our people are maybe more attuned to what they can do when there are problems that affect production.

And although paper production is a capital intensive process, production-focused effort can, in the words of Mill Manager Bauer, both “overcome the deficiencies of the equipment” and “get more out of the equipment.”

This caring, sensitivity, and attention are related concepts that fall under the perceived need (and desire) to increase production (Quadrant II, left center), and as perceived need to increase production increases, so does production-focused effort. The modifier “perceived” is used here to highlight the subjective reality that operates in an organizational setting, and “need” is synonymous with concepts like necessity, requisite, and desire. Need includes both external requirements (pulls) as well as internal compulsions (pushes).

The perceived need to increase production will appear in other sectors, particularly in the incentive bonus sector and information sharing sector, and so a full discussion of it is best saved for later. For now, it is enough to say that this perceived need to increase production is influenced in part by the production gap (Quadrant II, left center), the difference between the annual daily production goal established at the beginning of each fiscal year and the average level of production achieved. As this production gap increases, so does the perceived need to increase production. Once average production exceeds the production goal by some amount (i.e the production gap becomes negative), the perceived need to increase production more than likely begins to level-off or decline. As Mill Manager Bauer explained:

We had a whole month when the daily average was less than 700 tons. This was not a fun place to be. This was a lousy place to be...it literally is like somebody is sick in the family. You don't feel right. You walk out of here and, well you are concerned. You don't want to leave. You think you ought to stay here and do something.

He returned to the same topic when discussing the gainsharing bonus:

I read this mill performance information back to the employees. Why did we not do so very well? They want to know who in the hell is running this place, particularly when we are back running at less than 700 tons, and they know they can do better than that. “Okay big guy in charge. What’s your plan? What are you going to do to get this ox cart out of the ditch? I need to know when I am going to get my incentive back.”¹

Because paper production is capital intensive, additions to production capability (Quadrant III, upper right) influence the paper machine production rate. Operations Manager Russell spoke of the “need to pace ourselves” because things wear everyday and a “miniscule amount takes away from the capability every day.” Mill Manager Bauer spoke of the importance of removing capability roadblocks and the problems created by removing those roadblocks:

The paper machine is...pretty much at full potential. We are limited now by an intrinsic design feature, and that’s the drive. Now, if we can remove that roadblock it will allow us to run at a higher speed. Now all that’s going to do is create more problems. It will allow us to run faster and it will allow us to run and make more paper. But it is also going to mean that maintenance is maybe needed more. We may wear felts out faster. We may find other process roadblocks and we will. And so we are going to have to find those problems and fix them...

Commonwealth Paper is striving for a production capability of 1100 tons per day (At the time this research was conducted, the mill had a capability of 700 tons per day,

¹The words “gainsharing” and “incentive” were used interchangeably by managers during their interviews. They mean the same thing.

based on past average production. A new stock prep area and a new paper machine drive were installed in July in order to boost mill capability toward that 1100 ton per day goal). This capability gap (Quadrant II, right center) influences the perceived need to invest in capability (Quadrant II, lower right). As the capability gap increases, so does the perceived need to invest in capability. Once capability exceeds the capability goal by some amount (i.e the capability gap becomes negative), perceived need to invest in capability may begin to decline. Because CP wishes to remain debt free, additions to production capability are limited by available cash flow (Quadrant III, right center).² The mill manager provided a description of this cash flow approach to modernization:

Now when we present this approach of financing modernization out of cash flow — and let me say that I’ve had difficulty accepting this type of approach also — and say we are going to remove the speed roadblock, the operators on the machine go non-linear. They say, “Well if he did that the winder is not going to be able to keep up or if you do that the wet end is not going to be able to form paper or we are going to run out of refining or the fan pump won’t be big enough.” And what you say is, “You’re right. But now tell me which is going to happen first. You want me to go out there and fix all those things right now? Do you want us to shut down instead of 12 days...35 days? Instead of spending \$12 million dollars...\$35 million...And in which priority are those things going to happen?”...We’re operating out of our check book. We don’t have this reservoir or pool of money from which we can draw from. We are operating on cash flow. What you can afford to do is all that you can do.

²One of the roadblocks to performance improvement cited by top managers in their 1990 Strategic Plan and ranked 2nd overall was: conservative owners. Because of conservative owners who wished to remain debt-free, there were insufficient funds to acquire the state-of-the-art equipment available. For example, revised capital needs for 1991 totalled \$18.58 million. The cash available for capital was \$18.355 million. Another example of the limits which the cash flow approach places on modernization was provided by Human Resource Manager Hutchinson: “We have a goal to get to 1100 tons a day and we had a plan and the plan was thwarted by the downturn of the economy. Because our plan was 5-7 years to modernize the mill, spend a \$100 million plus, and now we’re not going to be able to do that as aggressively.”

5.1.2 PAPER MACHINE EFFICIENCY

Working in concert with the production rate, paper machine efficiency influences paper machine production. Operating time (Figure 5-1, Quadrant I, lower right), the denominator of the machine efficiency equation, is determined in large part by the preventive maintenance and modernization plan (Quadrant I, center). The shutdown that occurred in July to install a new stock prep area and a new paper machine drive is an example of how preventive maintenance and modernization plans influence operating time. Running time (Quadrant I, lower right), the numerator of the machine efficiency equation, is improved through the reduction of lost time (Quadrant IV, top center). Lost time is the sum total of all the time the paper machine is shutdown, with the exception of time lost from planned shutdowns for large scale preventive maintenance or modernization work or power company outages. When talking to top managers about lost time, one sees the importance of minutes in a process industry like paper. The meaning of lost time is best captured in this statement by Maintenance Manager Daniels:

If this mill is down more than 2% of the time, then I'm upset as the devil...that's rough, that's bad. I try to instill that into the mechanics...You've got...six paper machine breaks in one day. Two minutes for a break is 12 minutes a day. Like I say, five days like that you have already lost a ton of paper...I think you have to look at minutes more so than hours if you're trying to make the tons.

With each percentage increase in machine efficiency, \$500 million (at CP's current net selling prices) is added to revenues. Although operations and maintenance are budgeted for 100 minutes of lost time per day, both Operations Manager Russell and Maintenance Manager Daniels do not want to see lost time exceed 84 minutes per day (which translates

to roughly a 94% efficiency performance). According to Operations Manager Russell, lost time, maybe more so than the paper machine production rate, influences production:

The biggest things that affect the production of the mill is unscheduled lost time...the paper machine breaks, you're going to have those. The things that kill us are unscheduled outages that affect the production of paper.

Maintenance effort (Quadrant IV, center) is focused on reducing those unscheduled outages. Similar to production-focused effort, top managers at CP talk about the concern for, sensitivity to, and focus on maintenance — the perceived need to reduce lost time (Quadrant IV, right) — that influences the overall level of maintenance-focused effort.

Maintenance Manager Daniel explains:

We had problems in the pulp mill...we lost a pulp refiner and you're looking at eight hours work. We didn't have...a full crew in here, you know, and I would have had to call people in on Saturday night. It's hard to get them. So, I got on the phone and I asked if they would shut the woodyard down and let the people from the woodyard come over and start helping me. And the boys in the woodyard, they work with you if you shut down. They do it and they are good. And we got the thing going and didn't shut the paper machine down...I've been called in at night and we were down for some reason — and we don't want to be down too long — but I needed two jobs...to get done and I asked them to give me an operator for the electrician and an operator for the mechanic and I can do these two jobs. If I don't have them I'm not going to have the time to do it. And they done it. Just get through with it and get the mill running...That's the goal of everybody here, to get the mill running.

As the perceived need to reduce lost time increases, so does maintenance-focused effort and reductions in lost time. The perceived need to reduce lost time will appear in other sectors, particularly in the incentive bonus sector and information sharing sector, and so a full discussion of it is best saved for later. For now, it is enough to say that this

perceived need to reduce lost time is influenced in part by the lost time gap (Quadrant IV, upper right), the difference between the lost time goal established at the beginning of each fiscal year and the lost time achieved, as well as the production gap. As the the lost time gap increases, so does the perceived need to reduce lost time. And because production and lost time are often viewed as two sides of the same coin; as the production gap increases (Quadrant I, left center), so does the perceived need to reduce lost time.

Along with maintenance-focused effort, reductions in lost time (Quadrant IV, bottom center) such as maintenance planning, the use of outside contractors to supplement staff at clothing changes, and longer life fabrics and felts, work to reduce lost time or maintenance frequency (Quadrant I, lower left) or both. Reductions in lost time are guided by an airplane maintenance analogy used by top managers in describing their approach to lost time reduction. In the words of Operations Manager Russell:

When that airplanes lands (meaning the paper machine) and people get off it, you take it back to the shop and work on it. You want to get everything done because you don't have the opportunity once it takes off again. That's what we do with the paper machine. We shut it down once a month for maintenance, clothing, or whatever needs to be done.. We take the time that we think we need to do that and...then once that's over with and we launch that paper machine again; we hope and expect it to go until the next scheduled out. And if things crop up that are preventable or things that we feel...we should have caught...that's what we consider a...failure on our part to keep that paper machine running or anything else running that is essential to that paper machine.

Mill Manager Bauer, in describing the airplane analogy, provided an example of the benefits provided by this approach to reducing lost time:

When that paper machine is down for clothing, you better do your maintenance...Three years ago, we could not predict how long we would run between felts. We have two felts and they are the shortest term, shortest life, piece of equipment and they really...dictate when you take the paper machine down. The two felts at that time you couldn't depend on...lasting 28 days...and they were out of phase with each other. One would go need changing before the other and a lot of the time you decided to forego life on one set of felts because the other needed changing and it was convenient, so why not....The point is predictability. Getting a maintenance schedule that you can depend on and plan for. And the key is in the planning as opposed to this shutdown when...needed basis, which is disastrous. If I had to put one of the key indicators or key measures of performance improvement it would be that very simple exercise where we found felts that we could predict the life of and we put on the calendar the days we planned to shutdown. And over the past year our ability to do that has improved. And that's the reason we are going from 88% percent paper machine efficiency to 92 plus to almost 94 percent. And son, those are dollars. Absolutely...In any process industry where you're running continuously and time is money...being able to produce and plan...are the keys.

This type of thinking — that reductions in lost time lead to increased production — extends even to the administrative side of CP. Human Resource Manager Hutchinson stated that:

I think the thing that's had as much impact as anything on uptime on the machine are the things they've done in maintenance and operations to reduce the amount of downtime...the more uptime you have, the more production you're going to make.

Because reductions in lost time often require capital, they are limited by available cash flow (Quadrant III, right center).

5.1.3 AVAILABLE DATA FOR PRODUCTION SECTOR VALIDATION

The translation of the site-specific model to a mathematical simulation model was beyond this research study's scope. Therefore, quantitative data were not examined for model support. However, to assist future research studies, Table 5-1 lists the production sector variables and the availability of quantitative historical data.

Table 5-1. Data for Production Sector Validation

Variable	Quantitative, Historical Data	Comments
Figure 5-1, Quadrant I		
Preventive Maintenance Plan	X	Scheduled downtime
Operating Time	X	
Running Time	X	
Maintenance Frequency	?	Data may be avail.
Product Characteristics	X	Product mix
Figure 5-1, Quadrant II		
Production Capability	X	
Capability Goal	X	
Capability Gap	X	Calculated
Need to Invest in Capability		Assumed
Avg. Daily Production Goal	X	
Average Production	X	Calculated
Production Gap	X	Calculated
Need to Increase Production		Assumed
Production Focused Effort		Assumed
Paper Machine Production Rate	X	
Paper Machine Production	X	
Figure 5-1, Quadrant III		
Additions to Prod Capability	X	
Cash Flow	X	
Strategic Plan	X	Cash Flow Require.
Work Rule Restrictions		Assumed
Figure 5-1, Quadrant IV		
Lost Time Goal	X	
Lost Time	X	
Lost Time Gap	X	Calculated
Need to Reduce Lost Time		Assumed
Maintenance Focused Effort		Assumed
Reductions in Lost Time	X	

5.2 THE FINANCIAL PERFORMANCE SECTOR

While production may be first at CP, financial performance is a close second. One cannot help but be impressed by the accuracy of their financial forecasting (the margin of error in both selling price and material prices is less than 5%), and their level of cost control (manufacturing costs per ton for fiscal year 1991 were almost 6.5% below budget.) The organization is, in the words of President Allen, “accountant driven,” but the production emphasis provides the needed balance of “spend(ing) the money when it helps.” Because CP produces a commodity product, the selling price of the product is extremely sensitive to the economy at large, and the marketing practices and financial performance of large producers. It is worth quoting Mill Manager Bauer at length in his discussion of the marketplace to see both the importance of selling price to CP and the emotional response it evokes in top managers.

What is absolutely fascinating for me to watch is the ineptitude of executive level decision makers in this industry. Absolutely incompetent. They ought to be charged with impersonating responsible decision makers. We have lost 30 percent of our selling price in a little over 24 months. Why? Okay, the recession. That’s part of it, but that’s not all of it. There are a few, a handful, less than ten monumental egos attached to humans out there who are making the decision that one company is going to get a competitive advantage over another company. Gain market share and increase cash flow so they can support their drug habit called expansion. So they have gone out and purchased a smaller paper company to make a larger paper company. They have incurred enormous amounts of debt. They need the cash to support that...And these guys think that they can support their drug habit by stealing customers from one of the others. And the others say, “Like hell you will. You’re not going to get market share from me. I’ll cut the price.” And the other then says, “No you’re not. I’m going to cut the price.” And before you know it 30 percent of the selling price is gone. And how long is it going to take for us to recover? See you got this group of people impersonating decision makers who have absolutely

destroyed our market. Commonwealth Paper is absolutely powerless to do anything about it...However, we have protected our market share, small though it may be. And we're running. We've not taken down time. Some of those big guys have finally realized they are going to have to take turns out of the market place to stop this hemorrhage because right now they're pretty close to break even.

Commonwealth Paper, therefore, takes a follower strategy on price, and continually tries to buffer itself from the effects of depressed prices by aggressively controlling costs and increasing production. In other words, they practice productivity improvement, not price recovery, knowing that the cycle of declining then rising selling prices described above will occur over and over again.

Figure 5-2 portrays the variables and relationships that influence financial performance at CP as it relates to production and the gainsharing program. The importance of this sector in relation to the production sector lies in its influence on the perceived need to increase production. Its importance in relation to the gainsharing program is that it determines CP's financial ability to pay the incentive bonus earned during any given period. For the above reasons, financial performance variables and relationships were treated as a separate model sector rather than grouped with the production sector.

Some simplifications were made in Figure 5-2 in the portrayal of performance gaps and the various determinants of total cost. For example, the various mathematical relationships that determine budget performance are not shown. Likewise, all the contributions of cost, such as incentive bonus payments (or fixed cost- and variable cost-production relationships), are not shown. However, the simplifications allowed a clearer portrayal of this sector (because of fewer variables), and given the purpose of the larger model — which is intended to show how gainsharing impacts CP's performance — the simplifications seemed justified.

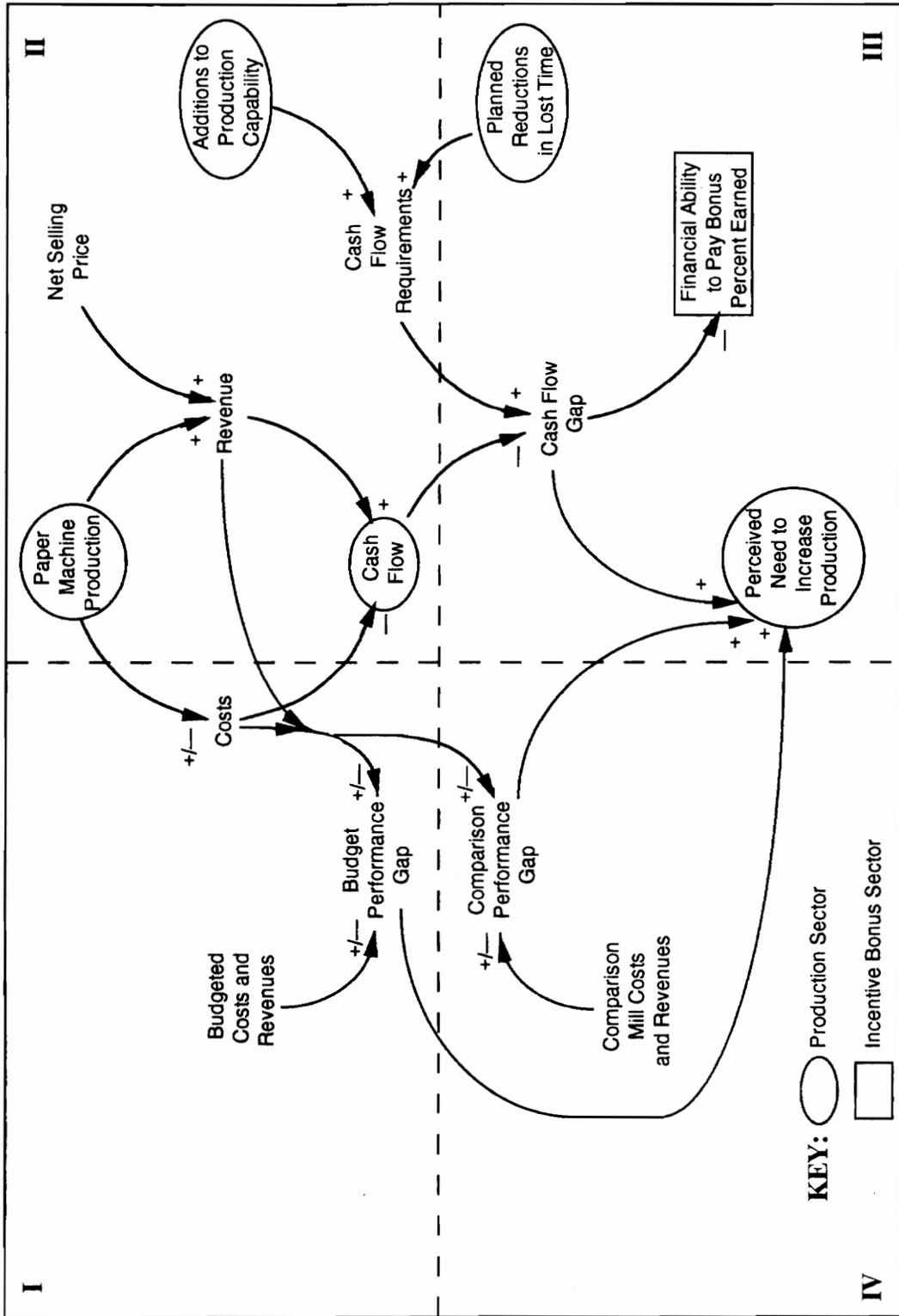


Figure 5-2. The Financial Performance Sector

As shown in Figure 5-2, the net selling price of the product (Quadrant II, upper right), in combination with paper machine production (Quadrant II, upper left), determines revenues (Quadrant II, center). Revenue less costs (Quadrant I, right), which fluctuate with paper machine production, provides CP's cash flow (Quadrant II, lower left). Cash flow requirements (Quadrant II, lower right) are determined by additions to production capability (Quadrant II, middle right) and reductions in lost time (Quadrant III, upper right). As the cash flow gap (Quadrant III, top center) — the difference between cash flow requirements and available cash flow — increases, the perceived need to increase production increases (Quadrant III, lower left). Again, this perceived need to increase production goes back to top management's belief that production is the only way CP can help itself. The perceived need to increase production is also influenced by CP's financial performance in comparison to budgets (Quadrant I, lower right) and other paper mills (Quadrant IV, upper right), which are discussed during the 4th Working Day meetings held monthly by CP's top managers. As Financial Manager Kohler explained:

The financial results are definitely a measure of results, but you've gotta go beyond the numbers. Like this year we are having an off year. And the measurement of our success is not that, well gee, our profits are down 44%, but how we are doing compared to other people. How are we doing compared to where we thought we were going to be? And we feel like even though the market is down, we're having a positive year because we've been successful in meeting our goals or exceeding our goals and doing as well or better than our peers in the industry. So we just don't look at the numbers and say, "Gee. It's off. We're bad. We're terrible. We're having a tough time." That may be true, but we are able to analyze that information to a point where we can feel good about what we have accomplished. And so we measure our performance against our budgets...and against our peers.

Commonwealth Paper's ability to fund additions to production capability and lost time reduction projects, as well as its ability to pay any incentive bonus earned (Quadrant III, middle right), decreases as the cash flow gap increases. Although selling price is extremely variable in the paper industry, CP's gainsharing program has no direct linkage to selling price. The reason for no incentive bonus-selling price linkage is that the designers of the gainsharing program believed it unfair to tie the program into selling price because CP employees have no control over it. However, the absence of such a linkage can cause problems when it comes to paying the incentive bonus. Such was the case during the recession of 1982-83 as described by Financial Manager Kohler:

There was also a time, if we go back into the early 80s — the recession we had in 82-83 — when financially the company could not afford to pay incentive and so what we did at that point was we maintained the incentive formula the way it was, but for that two years we only paid 25% of what the formula calculated...And we gave them justification to why, financially why— cash flow, profits, the whole picture — we gave them information so they knew why we could not guarantee the money would ever be paid them but we would keep records of what they would have received and what they did receive and if we could ever pay the difference back we would.³

The financial ability to pay the incentive bonus was also on the mind of the President Allen. He talked about this linkage when asked if he would do anything differently if he was given the chance to start CP again:

³The reference in this quote to information sharing provides a nice example of how the model sectors interact with and blend into each other, often making it difficult to clearly tell where one sector ends and the other begins. More attention will be given to the sharing of financial performance information in Section 4.5.

The only thing that has bothered me for years is this incentive compensation program. Not that we have one, but that we didn't think it through enough...I would have it tailored a little differently so that it was somewhat automatically self-adjusting and self-correcting. We paid incentive one year when we lost \$3 million. The program should not only reflect production, but also consider the ability to pay and have some relationship to the profitability of the Company...That's why we had to change our program slightly because if we continue with no change and every dollar that we spend in capital money improves the capability of the mill to produce more tons, it will continue to increase the incentive payout. And, even though we attempt to adjust the base from which we determine the amount of incentive to be paid, you just can't adequately do the job, because some of the capital expenditures require a long learning curve.

The slight change and adjustment to the base referred to above was actually a return to the program's original design in which production goals would be developed annually by management on the basis of mill capability, and the incentive bonus percentages would be based on these production goals. This return to the original design will help ensure, to a certain degree, the financial ability to pay the incentive bonus because it restricts what President Allen and Financial Manager Kohler call "incentive creep." Incentive creep results from additions to production capability and no corresponding change in the incentive base production tonnage. For example, new equipment installed in late 1987 resulted in an increase in production capability that translated because of no corresponding change in the incentive base into a 2.5% incentive bonus increase.

5.2.1 AVAILABLE DATA FOR FINANCIAL SECTOR VALIDATION

To assist future research studies, Table 5-2 lists the financial performance sector variables and the availability of quantitative historical data.

Table 5-2. Data for Financial Performance Sector Validation

Variable	Quantitative, Historical Data	Comments
Figure 5-2, Quadrant I		
Budgeted Costs, Revenue	X	
Costs	X	
Budget Performance Gap	X	Calculated
Figure 5-2, Quadrant II		
Revenue	X	
Net Selling Price	X	
Cash Flow Requirements	X	
Figure 5-2, Quadrant III		
Cash Flow Gap	X	Calculated
Figure 5-2, Quadrant IV		
Comparison Mill Costs, Revenues	X	
Comparison Performance Gap	X	Calculated

5.3 THE COMPENSATION SECTOR

Traditionally, the purpose of a compensation system — that is, the sum total of base pay, premium pay, incentives, and benefits — is to attract and retain quality people and motivate people to perform. While CP's compensation system includes these more traditional purposes, it goes beyond them and focuses more on the concept of partnership. It is a system designed to visibly reinforce CP's "Principles of the Partnership," minimizing invidious distinctions and fostering quality relationships both within and among groups. For example, the compensation ratio at CP between the highest paid manager and lowest paid worker is around 3 to 1, whereas the average compensation ratio (excluding benefits) of major U.S. corporations is in the neighborhood of 85 to 1 (Business Week, 5-6-91).

From its founding, CP has strived to create the feeling of togetherness, that this organization is truly a partnership. Commonwealth Paper's pay practices are perhaps, with the exception of information sharing, the most visible symbols of this partnership. Everyone at CP is paid according to the same job evaluation plan; there are no separate plans for hourly employees, salary employees, and top managers. Everyone participates in the incentive bonus plan (its relationship to the quality of labor-management relations will be described in Section 5.6). Everyone receives the same benefits. By minimizing status and pay differentials, CP seems to have fostered a feeling of togetherness. By minimizing, as best they can, the manager-employee reward gap, they have helped influence the quality of labor-management relations, which are talked about by top managers in terms of togetherness or partnership.

This concept of togetherness or partnership has been represented in Figure 5-3 as its opposite, "polarization." As the manager-employee reward gap grows (Figure 5-3,

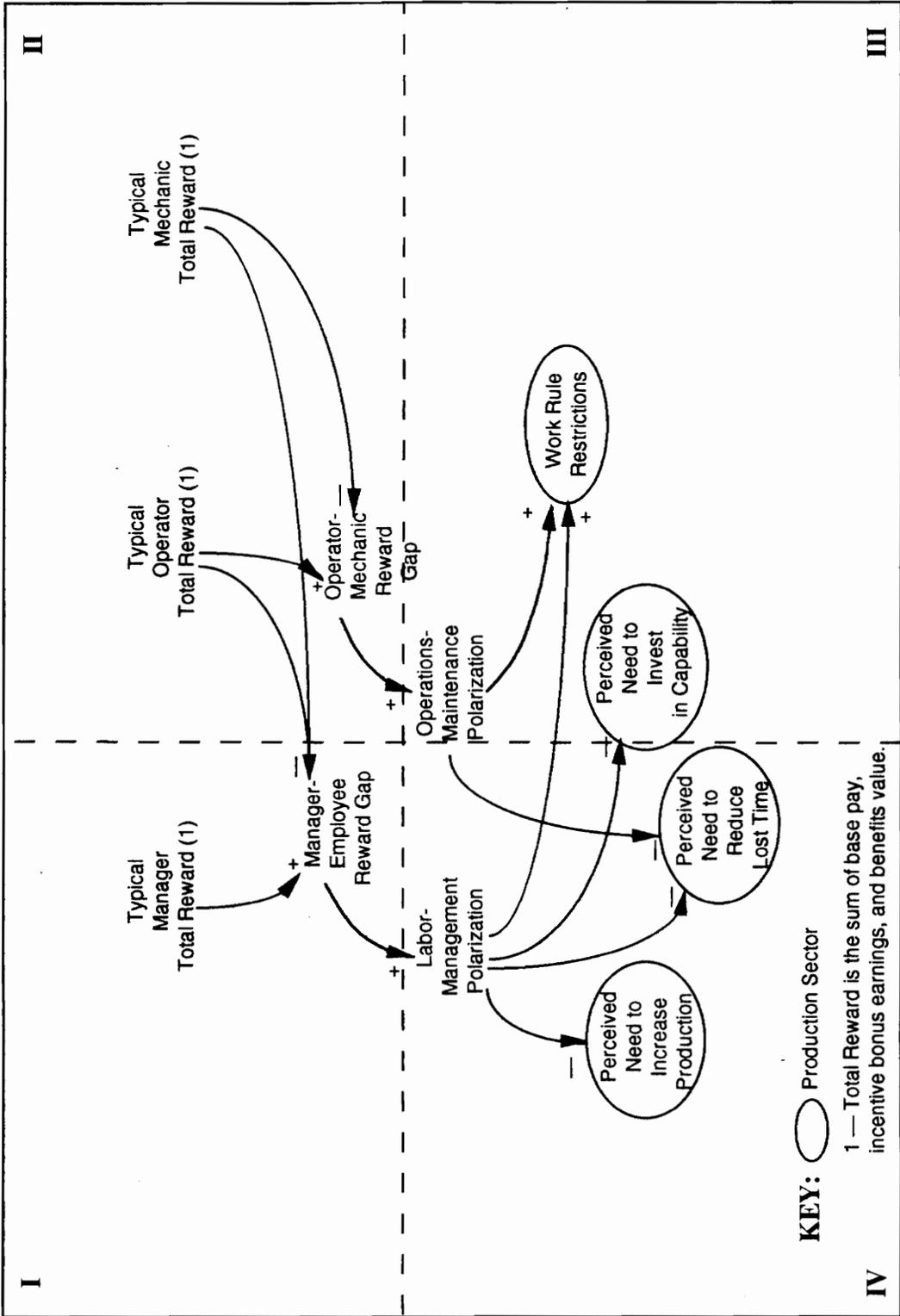


Figure 5-3. The Compensation Sector

Quadrant I, lower right), labor-management polarization tends to occur (Quadrant IV, upper right) and the quality of labor-management relations declines. The same holds true for operators and mechanics. It is not uncommon in the paper industry, in those mills with some type of pay-for-performance program, to have a separate plan for operators or for mechanics or for both. As the operator-mechanic reward gap grows (Quadrant II, lower left), operations and maintenance tend to become polarized (Quadrant III, upper left). The togetherness fostered by CP's compensation system was best described by Operations Manager Russell, Maintenance Manager Daniels, and Mill Manager Bauer respectively:

Everybody's in it together...You've got the machine tender, pulp mill, power operator, woodyard operator, and shift mechanic are the top classifications, so they are all paid the same rate...So if you talk, "you guys in the woodyard and us guys over on the paper mill," they are all together. I mean the pay helps bring them together and if the incentive is there also...We pay good wages.... You might be hard pressed to tell a supervisor from who are operators because of the culture we have evolved. And it has been promoted by the incentive program, no doubt about that. (Operations Manager Russell)

We salary people have the same retirement as hourly...because we're a partnership. Same retirement. I guess that's another unique thing about CP. They are probably one of the only mills that got the same retirement. Most — I'd say 95% — of the mills have retirement for salary people and they have retirement for hourly people. Our retirement for hourly people here is better than any we looked at for hourly people and about the worst we looked at for salary people. (Maintenance Manager Daniels)

You know, in a lot of cases a operator is like a...race car driver. He gets in, puts his helmet on....starts the engine, puts it in gear, mashes down on the accelerator and runs like hell. Goes around and around the track. And may win. But if he needs to change tires; if he's got a problem with the engine; if he needs more fuel, he comes in and says, "Hey pit crew. Put some gas in. Change those tires. I got a knock. I got a miss. Fix it." And you don't want that. You don't want that race car driver mentality. You want, "I'll tell you what it is and as a matter of fact I'll help you fix it...I don't have to be the glamour boy that all I do is race on

Sunday.” So you want to get away from the mentality of “I drive and you fix.” That’s the operations versus maintenance battle that tears a lot of mills apart, a lot of operations apart. It doesn’t have to be a paper mill.

Togetherness, partnership, always seems to be on the minds of CP’s top managers. It goes by different names, but whatever the name given it, it is considered the utmost of importance. To Operations Manager Russell, labor-management togetherness was referred to as credibility:

Credibility. That’s the only thing that...the management people have really developed and given the hourly people...They have to have that credibility in the management of this company. That we’re going to look out for them...I guess that’s what cements this thing that keeps the third party out. (i.e. the union). The third party in our relationship is credibility.

To Human Resource Manager Hutchinson it was addressed in terms of mutual trust and respect:

We treat our employees in a way that is different from other companies. I think we respect our employees and try to treat them that way with dignity. Even so, we probably disappoint them on occasion and they disappoint us on occasion, but our goal is to treat each other with mutual respect. This is one of our “Principles of the Partnership.”

And President Allen talked about it in terms of fairness:

What a good thing we have going. Yet, on the other hand, we could lose it overnight...So this is not something that is going to last forever if you don’t work at it. You have to work at it constantly...And you have a multitude of issues that are constantly coming up and you have to evaluate those issues and you have to find that thin line that is in appearance and in fact absolutely fair. If you can’t find that line then don’t make the decision. Keep working on it...We want to

always make sure we are staying within that fine line of fairness to both the Corporation and to the people. And that's an ongoing process, and it just continues forever and forever.

The reputation of labor-management relations at CP extends beyond the mill. A project engineer, with 20 years experience in the paper industry, and a construction manager, with 30 years experience in the paper industry, both of whom were involved in the installation of a new stock prep area, spoke of how refreshing it was to work with CP, how accessible everyone was, and how “everyone seems to know where they're going because they're all going in the same direction.” The story was told by Mill Manager Bauer of a technician interview that occurred recently in which:

One of the questions I asked him was, “Okay, now you're working in a union shop and we're non-union. What do you think about that?” He said, “Well, I tell you from what I know about CP you all don't need a union. Where I am right now you need a union.” And I know what he is talking about because I used to work where he's working and he's right.

Because of the quality of labor-management relations, everybody is working toward the same end. That is, there is a shared, perceived need to increase production, reduce lost time, and invest in capability (see Quadrant III, left, and Quadrant IV, bottom). Examples were given by Mill Manager Bauer of how poor labor-management relationships take on a life of their own, distracting individuals and groups from the organization's broader purpose and goals:

I was Vice President and Assistant General Manager of a 1500 employee, five paper machine, largest newsprint manufacturer in North America...the scope of the job was a little bit broader than this one, but I had a hell of a lot less accountability and responsibility...A great deal of my time — I'm not going to say was spent — I'm going to say was

wasted in labor relationships. Because if you stop and think about some of the absolutely inane, superficial, procedural issues that unions focus on and take up time. The cost, if you just put dollars on hours, would be enormous.

The wasted energy Mill Manager Bauer referred to that comes as a result of labor-management polarization was echoed by Maintenance Manager Daniels, who himself was a former shop steward at a paper mill (he was referred to by one manager as “the best, toughest union steward the Big Northern Paper Company ever had”):

The union don't want what Commonwealth Paper has. I don't mean the people. I mean some of these hard core union people and the union representatives. The don't want it. You take the shop steward in a mill, and I used to be one, his time is spent with grievances. You pay that man for grievances.

Because labor and management at CP view and treat each other as partners, there is more opportunity to increase production and reduce lost time because of few, if any, restrictive work rules and practices (Quadrant III, center).⁴ As Maintenance Manager Daniels explained:

If you need an extra set of hands to help somebody in maintenance get something done in a hurry, you've got those hands available. And that makes a heck of a lot of difference to have this extra pair of hands. Probably another unique thing about this mill is we can go out and get a local contractor to come in and help us six to eight hours with a felt change. Like tomorrow, I'll have available probably 38 total maintenance people and I need 60 to do the work I've got to do in five hours. So, I'm going to pick up those extra hands through local contractors.

⁴However, the lack of a union, or lack of work rule restrictions, does not make managing at CP easy. In fact, top managers who have worked in union mills believed it harder to manage at CP because there were no hard and fast rules. According Operations Manager Russell, “Managing a non-union mill is something harder because in a union mill you open the book and there it is. We have a book but there are a lot of blank papers in it.” The Maintenance Manager Daniels added, “If it's union, everything is in black and white.”

The benefits of flexible work rules were echoed by Human Resource Manager Hutchinson:

One thing that works along with the incentive here is the fact that the barriers that exist in a union mill are absent here. We don't have contractual restrictive work practices that says we can't ask you, the electrician, to help the machine tender. And so you can have gainsharing programs in a union setting but you never get the bang that you get in a union-free setting because the latter is less restrictive. When that paper machine goes down, you wouldn't be able to pick out a maintenance employee from a paper machine employee.

Managers and engineers can offer assistance to operators and mechanics, further strengthening feelings of togetherness. One can begin to see, in the following comment by Mill Manager Bauer, the vicious circle created by declining labor-management relations and how difficult it becomes to break that circle once it starts: as labor-management relations worsen, work restrictions are put in place that provide fewer and fewer opportunities for labor and management to work side-by-side or for labor and management to do the everyday, little things that make for a quality relationship, further worsening labor-management relations:

You don't have the built in restrictions that a union contract would foster. Even salary people could pick up tools. Maybe I'm getting in the way but at least I'm showing I'm not too good to help out. And I think they appreciate that.

5.3.1 AVAILABLE DATA FOR COMPENSATION SECTOR VALIDATION

To assist future research studies, Table 5-3 lists the compensation sector variables and the availability of quantitative historical data.

Table 5-3. Data for Compensation Sector Validation

Variable	Quantitative, Historical Data	Comments
Figure 5-3, Quadrant I		
Typical Manager Total Reward	X	
Manager-Employee Reward Gap	X	Calculated
Figure 5-3, Quadrant II		
Typical Operator Total Reward	X	
Typical Mechanic Total Reward	X	
Operator-Mechanic Reward Gap	X	Calculated
Figure 5-3, Quadrant III		
Operations-Maint. Polarization		Assumed
Figure 5-3, Quadrant IV		
Labor-Management Polarization		Assumed

5.4 THE PARTICIPATION SECTOR

Participation or involvement in performance improvement occurs at two, somewhat distinct levels at CP: formal and informal. At a formal level, there is a “participative strategic planning process,” and an “action team” process in which top managers, supervisors, engineers, operators, and mechanics work together to design and implement additions to production capability and reductions in lost time. This action team process is one of the types most associated with participative management.

An outsider’s first impression of CP’s participative management practices would be that not much is going on outside this action team process. However, to understand participation at CP, one has to go beyond formal processes. Formal participation at CP has been a more recent development that really began three years ago with the hiring of the new mill manager. Most of the participation that occurs at CP is informal, occurring in the course of daily operations as individuals and groups go beyond formal job descriptions and functions to contribute additional effort. It is this type of informal participation which was designed in from the company’s beginnings and from which it probably receives the greatest performance benefits. And, at this stage of CP’s formal participation program development, informal participation is more closely connected to the gainsharing program. However, there are plans to forge a stronger linkage between formal participation and the gainsharing program. The variables and relationships that comprise both the formal participation and informal participation sector are shown in Figure 5-4. Formal participation is described first and informal participation (Figure 5-4, Quadrant II, inset in upper right).is described second

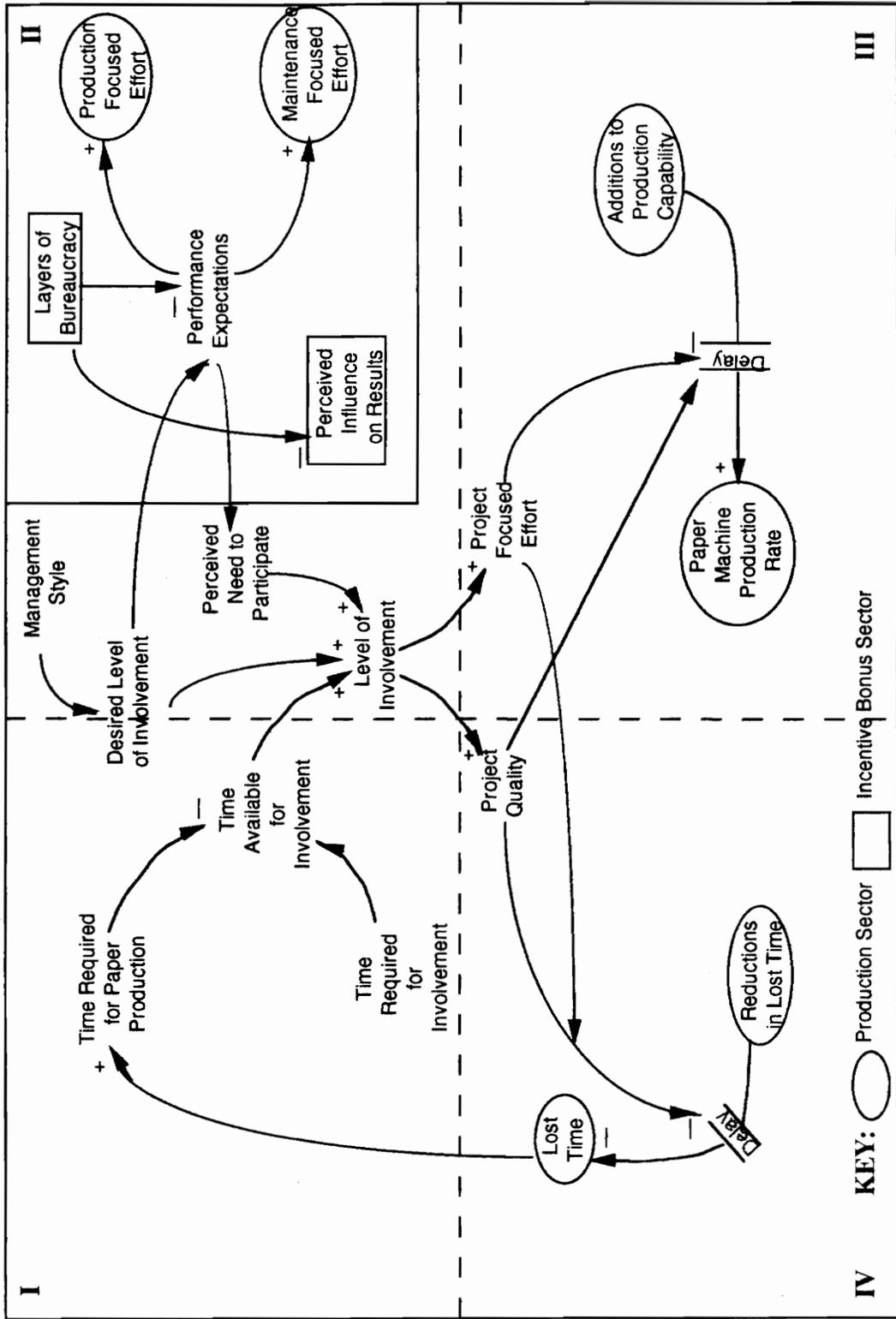


Figure 5-4. The Participation Sector

5.4.1 FORMAL PARTICIPATION

Formal participation or involvement in production capability projects and lost time reduction projects are a recent development at CP. Part of the reason for this is that CP now has the time to do it. Throughout most its history, the paper production process was extremely variable, creating crises and problems that consumed managers' and employees' time and attention. According to Mill Manager Bauer, lost time is the key to controlling production variability. In the last few years, they have implemented some programs that have improved process control (Figure 5-4, Quadrant IV); this has freed more time for involvement. However, the time available for involvement is still an issue (Quadrant I, left center). A study conducted by researchers from the Virginia Productivity Center (1989) found that managers and employees were struggling with the time requirements of a formal, participative approach (Quadrant I, bottom center). The time issue has still not been resolved, though progress has been made. Human Resource Manager Hutchinson stated:

We've got to wrestle with how to let these people have the time to participate when they're working 12 hour shifts and so forth.

Another reason formal participation at CP has somewhat lagged behind other management programs is management style (Quadrant II, upper left). President Allen's story about hiring Mill Manager Bauer reveals the influence of management style on participative management practices, in particular, the desired level of involvement (Quadrant II, upper left):

Mark Bauer is the third mill manager that we have had. The first mill manager was a hailstone, brimstone, hellfire, kick-

ass. He was a true blue, old style mill manager. He loved his people, and to a certain degree, they respected him. But he was a rough cut mill manager. He understood what we're trying to do around here and that tempered him somewhat. But he really just couldn't implement fully what we were talking about. He did a lot for Commonwealth Paper during our start-up years because we had difficulty achieving a proper level of production. This mill manager died of a heart attack at a fairly young age. We brought in another person that we believed would fit what we were trying to do here. He was in his late 50s, and, while on paper and talking to him, he sounded like he believed in the team concept, when he got here, he was of the old type papermill manager. When he reached age 64, I started looking for a replacement, and I knew specifically what I wanted: a person who believed in the team concept, believed in delegation, believed in giving people room to make their own decisions, believed in group participation, group decisions, believes in statistical process control, believes in training, and all these other things that we are trying to accomplish at Commonwealth Paper.⁵

President Allen's search for such a person lasted two years. During that time, he came to believe that "they just don't make people like we're looking for." In his opinion:

...you can't take someone from an environment that is entirely different, especially if he believes in and then works in that environment, and put him into a culture like we have here at Commonwealth Paper and expect him to function effectively within our environment. You just can't do that.

When he finally found, and hired, a mill manager who believed in and had practiced what CP was trying to do:

⁵A study conducted by researchers from the Virginia Productivity Center (1989) found that the autocratic style of the former mill manager was hindering the transition to a more participative style. Mill Manager Bauer believes that under his predecessor, the organization was to a great extent "driven by fear." Many managers and employees were never given the opportunity to do what they wanted to do or what they were capable of doing. The results from a series of organization-wide sessions conducted by the Virginia Productivity Center researchers to identify roadblocks to performance improvement lend some support to Mill Manager Bauer's perception.

...we were able to move forward towards fully implementing participation in planning, adopting statistical process control, developing training programs and implementing other programs that are important to us. We began to truly pull the team together like we had never been able to do before. Everyone did not make the transition, and it was necessary to make some changes. It's very important that when you bring a person aboard that he believe in the philosophy of the company and fit within the culture.

In the next few years, top managers envision action team involvement as part of everyone's job responsibilities, and are working toward that end. The desired level of involvement therefore influences performance expectations (Quadrant II, inset center). They also envision the action team process incorporating other improvement opportunities outside of capital intensive, production capability, and lost time reduction projects.

Top managers believe that as the level of involvement increases in production capability and lost time reduction projects, both project quality (Quadrant IV, upper right) and project-focused effort (or implementation-focused effort) increases (Quadrant III, upper left). Operations Manager Russell, in discussing the way in which most improvement projects are done at other mills (i.e. design, engineer, and install without operator and mechanic input), talked about the effects of a more participative approach on implementation effort:

We think there's a better way to come up with a project...Have input from all the principals in the mill: the engineering department, maintenance department, operations. This thing will work at Commonwealth Paper. They take ownership of it...When we start this press, you don't have operators who say, "I don't know anything about this. This isn't any good." Well, we may have missed some things, but they're not gonna go point fingers at engineers and say, "You didn't have my input at all. This things not worth a dime. I can't operate like this. You go down and start tearing it all down and redoing it as soon as you can."

Here again, as in the production sector, one sees that effort can be spent either on value-adding activity (like project implementation) or non-value adding activity (finger pointing, rework). The more physical or mental energy of the total energy available that is directed toward a value-added activity, like successfully implementing the project and making it work, the better. Involvement in production capability and lost time reduction projects influences the level of implementation or project-focused effort and its quality. In the words of the Financial Manager Kohler:

If they (i.e the operators) have direct input, you're going to get a better quality job and they are going to support, I would think, the operation of it more than if they didn't have any hand in designing it. They have a vested interest in making it work.

The level of project-focused effort and project quality that come as a result of participation were mentioned by the consultant project engineer and construction manager who were working on the new stock prep area. They attributed CP's action team approach for fewer design changes and a willingness on everyone's part to see the project completed on time and within schedule. Because of improved project quality and an increased level of project-focused effort, the delay between project implementation and project benefits is shortened (Quadrant IV, lower right, and Quadrant III, bottom center). As these projects are implemented, more time is available for involvement because of improved process control.

No top manager identified a direct linkage between the gainsharing program and formal participation. Because formal participation is a recent development, top managers are still struggling with, in the words of Human Resource Manager Hutchinson, both "what it looks like and how to make it work"; it is not surprising, therefore, that a linkage

between the gainsharing program and formal participation was not articulated. However, if a linkage does exist between the gainsharing program and formal participation, it is most likely to be found in the gainsharing program's influence on the perceived need to increase production and reduce lost time. Before CP embarked on its formal participation program, there seems to have been a perceived need on the employee's part to participate (Quadrant II, left center). Researchers from the Virginia Productivity Center (1989) identified this need as a common theme in the roadblocks identified by employees. The following story, told by Mill Manager Bauer, provides an example of an employee's desire to participate, but finds no opportunity to do so:

This story is not unique, but it kind of summarizes...There was an installation of a process piece of equipment at this mill. And it was a fabulous installation. It was beautiful. The drawings were super. The equipment was installed. The control room was well designed. It was turned over to operations. And the operators who had watched this installation go on from the time they put in the first structural steel until the time that it was completed...said, "Okay. What do you want us to do with this?" And before they even turned the key to start it up they said, "That's not going to work. Valves in the wrong place. And here's a whole laundry list." What have they done? They had watched the installation very carefully. Probably more carefully than anybody gave them credit for because it was in their area. And I mean you can only make so much progress on a given day...They're not that busy that they can't watch this whole thing being built from the ground up. And they had a list. This won't work. This won't work. Did you ever think about this? And when the installation was complete there was a little ...training session because, "Well we need to show these guys how to operate it." Well this list surfaced during the training session. It was another two or three weeks getting some of those things ironed out. The lesson that I learned from that is pretty obvious...it wasn't that they (i.e the operators) didn't care, because they cared. Imminently it was going to be their job to run it. Why hadn't they brought this up before? Nobody asked them.

There was a perceived need to participate on employees' part. However, there was no (or very limited) opportunity. The end result was the same: no or low level involvement (Quadrant II, lower left).

5.4.2 INFORMAL PARTICIPATION

Top managers at CP use the analogy of a lean, fuel efficient racer to describe their philosophy toward staffing, a philosophy that has its roots in the company's founding. In the words of President Allen, a piece of Chairman Neal's vision was that CP would be a place where

a group of highly motivated individuals who were good papermakers...would come together and perform the job based on their knowledge of what had to be done.

Even today, this vision influences staffing decisions to such a degree that CP is producing more tonnage per employee than anyone in the industry. Their goal, according to Human Resource Manager Hutchinson, is to "not carry one more body than is absolutely necessary." Because of lean staffing, performance expectations are set high (Figure 5-4, Quadrant II, inset center). As Finance Manager Kohler explained:

When the incentive program was put in place...it was presented as a way for the employees to participate in the success of the company and their participation would be directly related to the effort that they were willing to put forth. The fact that we were going to be somewhat understaffed — the concept of the lean racer — and they were going to need to put forth extra effort because we weren't going to have layer upon layer of employees to do certain jobs. They were going to have a job and it was going to be all they could do to do that job. They were going to have to do it efficiently, effectively, respond to problems, and correct those problems. So, you know, it...was made

clear to employees that here's something for you to participate in the incentive program, but here's what we expect from you in return. And while the people who were here originally are probably more attuned to it than people who have come afterwards, I think there is a period of time every employee gets that same feeling.

The incentive program is inextricably woven into this staffing philosophy because it is part of the bargain for this extra effort. More will be said about this in Section 5.6.

Top managers at CP believe an important part of their job is to protect the people who work for them from whatever bureaucracy that exists. President Allen, for example, looks at the organization as upside-down, with himself and other management there to support employees (Van Aiken, 1991). He is "at the bottom and up at the top you have a broad base of individuals that are out there in the trenches making the decisions...I don't want to get in their way, I just want to support them" and provide "the capital, so to speak, "for them to get the job done." This same view was echoed by the Operations Manager Russell, Maintenance Manager Daniels, and Mill Manager Bauer.

Because there are not, in the words of Finance Manager Kohler, "layer upon layer of employees" (Quadrant II, top center), there is a feeling that one can contribute and make a difference (Quadrant II, bottom center). This feeling was referred to by Finance Manager Kohler as "pride," Mill Manager Bauer as "confidence," and Human Resource Manager Hutchinson as "ownership." The perceived ability to influence results (which will be discussed in more detail in Section 5.6), together with performance expectations, create a type of informal participation. Informal in the sense that no management program defines it. People just contribute production-focused and maintenance-focused effort above and beyond job requirements (Quadrant II, right). And while there is a recognition on the part of top managers that the production process is capital intensive and most of the productivity gains come from additions to production capability, there is also a recognition that this extra

effort can and does make a difference in achieving those productivity gains. It especially plays a role in compensating for learning curve effects when new equipment is introduced, allowing for productivity gains to be realized in a shorter periods of time. “Dealing with the learning curve” came out in an explanation of mill performance by Mill Manager Bauer:

Some of the things that have transpired over the last two years are not organizational in nature. When I make that statement I am referring to...the productivity of the mill. They’re not organizational. They’re process-oriented. They were based on the equipment installed in late ‘87...But really and truly in this particular case, our guys are compensating...and they are operating really at a handicap. I personally believe that. They have overcome the deficiencies and have learned to operate the equipment at higher levels, in spite of, not because of, this equipment. And so the learning curve is still out there. They’ve just learned to deal with it.

5.4.3 AVAILABLE DATA FOR PARTICIPATION SECTOR VALIDATION

To assist future research studies, Table 5-4 lists the participation sector variables and the availability of quantitative historical data.

Table 5-4. Data for Participation Sector Validation

Variable	Quantitative, Historical Data	Comments
Figure 5-4, Quadrant I		
Time Required for Paper Production	?	Data may be avail.
Time Required for Involvement		Data not collected
Time Available for Involvement		Calculated
Figure 5-4, Quadrant II		
Desired Level of Involvement	X	Goal
Management Style		Assumed
Need to Participate		Assumed
Level of Involvement	X	Participation rate
Performance Expectations		Assumed
Figure 5-4, Quadrant III		
Project Focused Effort	Partial	Eg. Project hours
Figure 5-4, Quadrant IV		
Project Quality	Partial	Eg. Cost overruns

5.5 THE INFORMATION SHARING SECTOR

An outsider is not skeptical when top managers talk about openness at CP, because more performance information than one would ever expect — including financial performance — is volunteered to outsiders. Top managers claim that if they are guilty of anything, it is sharing too much information.

Information sharing is, in the words of President Allen, “a piece as important as the incentive program.” To understand how information sharing influences performance at CP, one has to go back and consider the performance gaps portrayed in the production sector (see Figure 5-1) and the financial performance sector (see Figure 5-2). The production gap, capability gap, lost time gap, budget performance gap, and comparison performance gap are information-based realities.⁶ For example, if an operator does not know what the production goal is, and she or he does not know what the paper machine production was on any given day, the production gap, for all intents and purposes, is anything the operator perceives it to be (or, more likely, whatever the rumor mill says it is). The same is true for the other performance gaps. It is in this sense that the performance gaps identified in the production sector and financial sector are more accurately labeled as “perceived” performance gaps, as shown in Quadrants II and III in Figure 5-5. The amount of information shared with everyone at CP helps influence shared performance perceptions so that everybody is working toward the same end. That is, there is a shared, perceived need to increase production, reduce lost time, and invest in capability.

One performance perception in particular, the production gap, is closely related to the gainsharing program. The linkage between the production gap and the gainsharing program was best described by Mill Manager Bauer (in a quote that was used in Section

⁶In organizations, if information is not shared, neither is reality (see Mitroff, 1989).

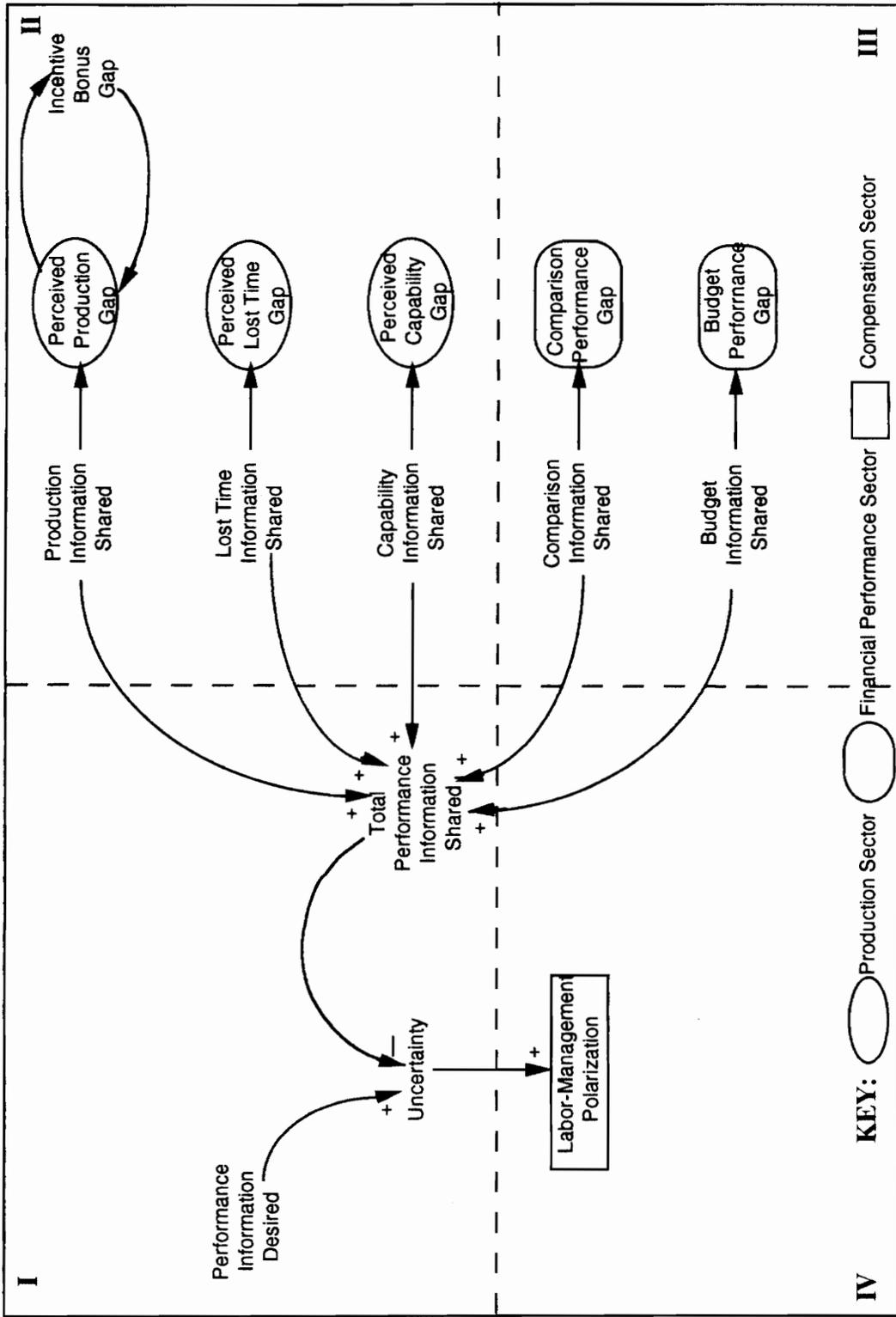


Figure 5-5. The Information Sharing Sector

5.1.1. to describe the influence of the production gap on the perceived need to increase production). It seems that the production gap and the gainsharing program are so closely linked in most people's mind that they are really two sides of the same coin. That is, the production gap, in the minds of many employees, translates to an incentive bonus gap (Figure 5-5, Quadrant II, upper right). As Financial Manager Kohler explained:

We give a company performance evaluation...review with employees. What we're doing right, what's wrong with the business or with the economy, what we've got to do to correct it, and what we plan to do to correct it. And production is always a key issue. "Hey look. The market's going down so the best thing we can do to boost profits is to boost production. In the back of everybody's mind, when you talk about production, that gainsharing plan is right there. So to me it's linked...It may not be directly linked. We don't get up there and say, "Look guys. If you'll produce another ten tons a day, you're going to get another percentage." But everybody knows that. We don't have to say it, because it's there.

While the gainsharing plan is in the "back of everybody's mind," including top managers, top managers seem reluctant to admit the influence of the incentive on their own behavior. Operations Manager Russell was typical in this regard:

I look at tons per day. I don't look at percent, what incentive pay is. I see in tons. Other people down here think, "We are going to make 15%. We are going to make 16%." I don't care about that. I think in tons.

It may be that top managers don't think in personal terms about the incentive. This, however, seems unlikely given the fact that anywhere from 15-17% of their pay comes from the incentive. A more plausible explanation for this attitude is a desire on the part of a top manager (and for that matter, other salaried employees) to see and portray himself as a company person (see Jackall, 1986). However, because the incentive is so tightly linked to

production, it does not really matter whether a person is trying to increase production or increase her or his incentive. The result is the same: an increase in production-focused or maintenance-focused effort.

Underlying this linkage between the production gap and the incentive bonus gap is the incentive bonus complexity (which is a function of the number of performance measures used). Although incentive bonus complexity is not included as a part of this sector (it is a part of the incentive bonus sector), it is worthwhile to discuss it briefly here. Several managers talked about the importance of having an incentive bonus calculation that is easily understood by everyone. Mill Manager Bauer, in discussing a proposed change (that was not accepted) in the incentive bonus calculation for the upcoming fiscal year, talked about the importance of having a bonus calculation that is easily understood:

...One of the reasons that I am less interested in Jeff's (the engineering manager) approach, which is the moving average history approach, is you never know where you are. The employees can't figure it out. They don't understand it and they don't know where you are. They don't know how to predict. Now you can walk around the mill and you can ask employees at random, "How does the incentive plan work? Where are we today? What was yesterday's number? How much did we pay last month?" An overwhelming majority of employees will be able to answer those questions because they know how it works, and they know how to calculate it. They have it committed to memory...They know the 550 ton base and know one percentage equals ten tons. They know that 750 is 20 percent...200 tons over the 550. I mean they just know how to figure it.

As the incentive bonus calculation increases in complexity, it becomes more difficult for people to see the production gap - incentive bonus gap relationship. The reason tons per day was selected as the basis for the incentive bonus was to keep the calculation simple so that everyone could easily understand where the bonus was coming from. Because most

everything in the company revolves around paper production, everyone can understand how the bonus calculation works and, according to President Allen, “believe in the formula that’s used” (Van Aiken, 1991).

The amount of information shared not only influences performance perceptions but also influences labor-management polarization (Quadrant IV, top center). Information sharing was identified by every top manager interviewed as influencing feelings of togetherness or partnership. President Allen articulated this view best:

Well, the incentive program was just one piece of the total package. I think a piece of the puzzle that is just as important as the incentive program is the openness and relationship and constant communication that goes up and down and across the organization. Good communication is probably as important and on the same level of building trust as a gainsharing program. If you have an incentive compensation program and you do not have a communication program, every time you have a conversation with the folks, it is going to be an adversarial discussion and your gainsharing program will not be effective. A gainsharing program is not enough to hold your employee relations together. The fact that we disclose everything to our people gives them the confidence that we are leveling with them and being honest and open by telling them all the facts.

The way in which labor-management polarization is influenced by the amount of information shared is in alleviating uncertainty (Quadrant I, bottom center). Uncertainty is the difference between the amount of information desired and the amount of information available or shared. The reduction of uncertainty was called different names by different managers — to Human Resource Manager Hutchinson it was eliminating “surprises,” and to Mill Manager Bauer it was “letting everyone know where we headed and why.” A good example of how sharing information alleviates uncertainty is its influence on takeaway fears. “Takeaway” is a term commonly used in the union-dominated paper industry. In

fact, every top manager interviewed mentioned it. Takeaway, in the words of President Allen, is

a word that is immediately used as soon as you change something, regardless of what it is. If it is more difficult to achieve what you had before, or what you had before is no longer going to be, then the word takeaway immediately surfaces. Takeaway is the most negative word that can be used toward management.

Commonwealth Paper sees information sharing as a way to let everyone know what lies ahead so takeaway fears are alleviated. Human Resource Manager Hutchinson spoke of this:

I agree with what Barry (the financial manager) just said...there's this fear of takeaway and that term is used...as if you can never go back and adjust for anything. I guess we have gotten through some issues, and we face one now and we've got one coming. It has nothing to do with gainsharing but...there's some piece of pay at risk to the employees on production that work Sundays. In our industry, more than half the mills that are union have eliminated Sunday premium pay. And that runs from \$3 to \$7,000...So we have told them...we're going to keep an eye on it. We'll be among the last to eliminate it, but...they know that...it's something we're watching. And they know we're looking at a new proposed incentive approach. They know that medical is becoming problematic. And there are little, more individualized issues...You are remiss if you don't address these issues. And I think we get on the front side of the curve...We've been talking about medical...since 1985...We don't spring this all on them at once.

5.5.1 AVAILABLE DATA FOR INFORMATION SECTOR VALIDATION

Because this sector's main effects are found in the production and financial performance sectors, and because the variables in this sector are qualitative, a table that shows available, quantitative historical data was not done.

5.6 THE INCENTIVE BONUS SECTOR

The variables and relationships that comprise the incentive bonus sector are shown in Figure 5-6. This picture and the following description of the bonus sector were the focal points of this research. However, as the research evolved it became clearer and clearer that the incentive bonus program was not something separate and distinct from the other pieces of the performance puzzle. In the words of Human Resource Manager Hutchinson:

If you get a bunch of people and you put them in a good work environment with no union and give them an opportunity to participate, pay them well, give them benefits to protect them and their families against major peril such as death and disability, and give them the opportunity to earn more (i.e. the incentive program), they are going to work hard and feel ownership in the process.

While his statement describes CP in a nutshell, all the top managers interviewed spoke of the complexity associated with doing those things. What these top managers implied throughout their interviews was that, from a definitional perspective, one can isolate a gainsharing program from other management programs; operationally though, this precise definition and isolation becomes more difficult. The gainsharing program and its effects

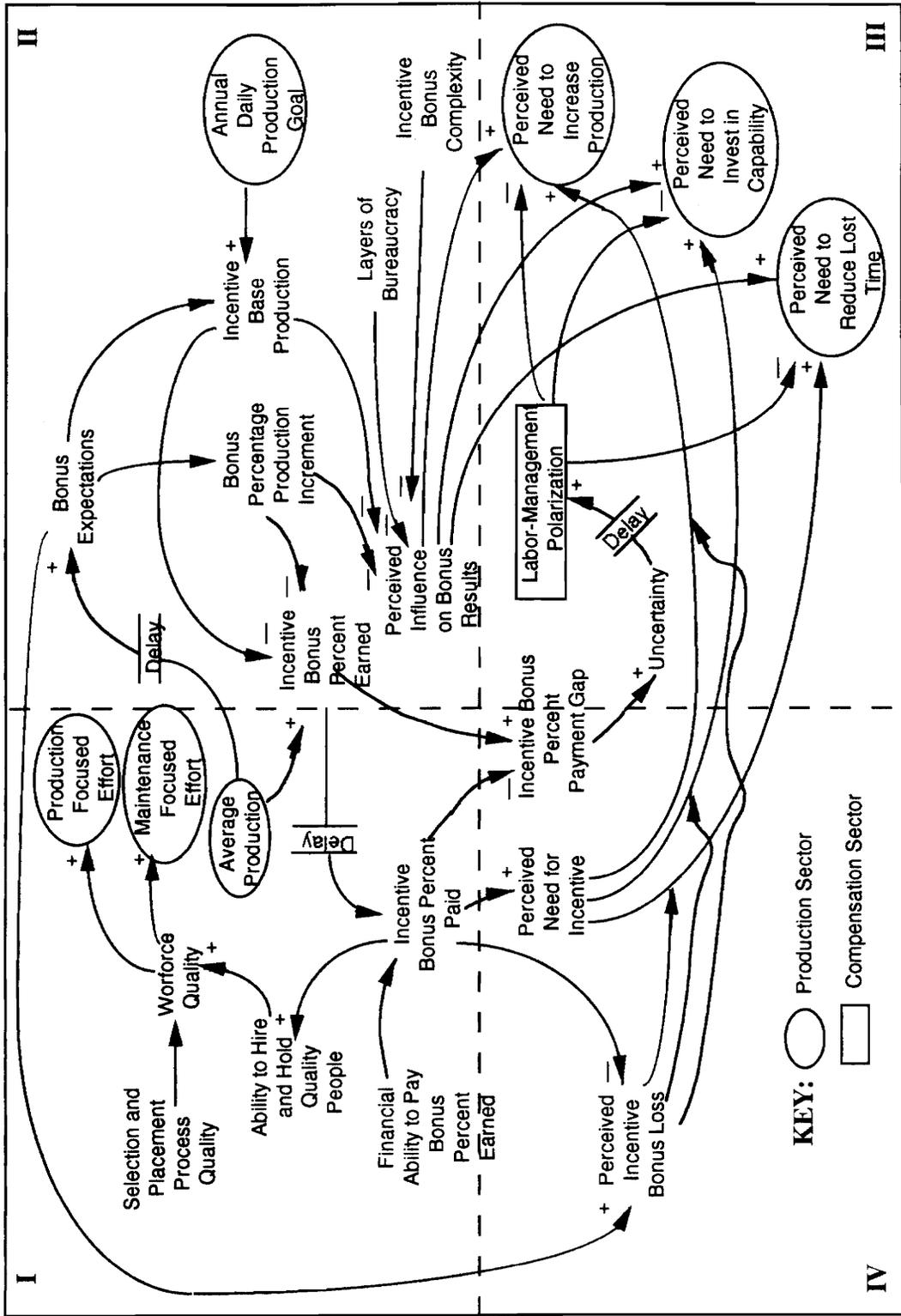


Figure 5-6. The Incentive Bonus Sector

are dynamic, interacting with a multiplicity of forces that permeate organizational life at CP.

The original research question which asked, “How does a gainsharing program affect organizational performance?,” would have been better stated as two questions: 1) What organizational performance variables and relationships does a gainsharing program affect? and 2) How are they affected? It seems that one first needs to understand the variables and relationships which affect performance before one can understand how gainsharing works to influence that performance. This makes sense if one considers the intended purpose of management policies and programs — to improve organizational performance. This broader performance focus has been conspicuously absent from prior gainsharing research. While more will be said about this in the following chapter, it is important to mention it now because the description of how the gainsharing program affects performance at CP begins with the “what” and then the “how.”

5.6.1 WHAT GAINSHARING INFLUENCES

The gainsharing program, as stated at the beginning of this chapter, has always been at CP. All the top managers interviewed referred to it as the “proof of the partnership.” One is reminded of the old adage that begins with “money talks,” when Financial Manager Kohler summarized his interview comments by saying:

You know, if you cut through all the crap, financial security is the most important thing to most people. The gainsharing program...supports our whole culture, our whole way of operating, our whole way of treating employees.

It is in this comment that one begins to see that the gainsharing program may act as a lever, providing the needed leverage for other management programs to be effective.

President Allen's recollection of the program's design process, of which he was a part, supports the above point. It is worth quoting at length in regard to this point:

Rich Neal (the chairman) wanted a company that would be entirely different from the norm in that there would be no job descriptions that prevented one from doing what he knew should be done. He visualized a group of highly motivated individuals who were good papermakers, and they all would come together and perform the job based on their knowledge of what had to be done. In return for this, he wanted them to participate in the performance of the Company and be able to enhance their earnings as the Company was able to perform at a higher level. He wanted it to be a partnership and he coined the slogan, "Partnership in Progress." During one Board meeting in 1975, we asked ourselves, "What is going to make all these people we are hiring believe that if they come to work for us, we are going to treat them as family and participate in the performance of the Company? How are you going to make these people believe that?" Rich (the chairman) stated that we had to have something up front that they can see and believe in. They had to have something that would indicate we are sincere about what we are trying to do. And it's got to be cash, because that's what talks...So, why an incentive compensation program? It was driven by the owner's need to have a group of people who believed in and felt about the Company the way the owner did. That is to say, we are in this thing together, we will come together and build a new company, and then we will all share in the performance of the company. Mr. Neal gambled his investment, and each employee who came to the Company in the beginning gambled their careers by coming to a new company. And, if the Company survives and grows, then everybody is going to benefit. So, it was driven by the need to put together the right attitude among all of us here, to work toward the same end and have a company that is excellent in every way.

This "right attitude," to work for the same end goes by another name: cooperation. Cooperation at CP translates to a wide-spread, shared perceived need to increase production, reduce lost time, and invest in capability (Figure 5-6, Quadrant III, right).

While information sharing influences these perceptions, and the degree of labor management polarization influences them also, it is the incentive bonus that provides the added leverage. Evidence of this added leverage is provided by President Allen as he spoke of CP's early years:

If it had not been for the incentive these other things we're doing probably would have never fallen in place. And it allowed us to do it. When things were tough and we were having terrible problems...rather than people getting angry with each other, back biting, it didn't happen because the incentive was a carrot there for everybody. "Man, we have to turn this thing around; we have to make it work."

Throughout the interviews, top managers spoke of cooperation and related concepts like sensitivity, focus, team, working together, and, in the words of Mill Manager Bauer, being "plugged into the heart of our operation":

The incentive was kind of a fascinating twist. I had never really been exposed to that type of compensation. And while I enjoy the direct results of the compensation personally, financially, it has taken a little while to understand what it means to the organization...This is a powerful force, and I am not sure that I fully understand it just yet. But I'll tell you it means a great deal to the employees. Is it a motivator? Yes, it is a motivator...a dozen little stories come to mind. The employees at this mill watch that production scoreboard. Where else would an accountant, a bookkeeper, a computer programmer, a secretary, a custodian, somebody in the woodyard, really care what yesterday's production was? It don't happen...So, right away everybody is plugged into the heart of our operation. They are concerned about it. When it goes well, they feel good. When it goes badly, there is somebody sick in the family. And I mean that literally...So there is an awareness, a sensitivity, a concern, a genuine interest that comes as a result of that incentive.

Production performance (see Figure 5-1) and financial performance (see Figure 5-2) all follow from the effects produced by those three key variables — the perceived need

to increase production, the perceived need to reduce lost time, and the perceived need to invest in capability (Figure 5-6, Quadrant III, right) — that are, in a sense, leveraged by the incentive program. The following story, provided by the mill manager, is an example:

We've got a quality control, hourly paid individual, a quality technician, I guess...Her job function is really more toward the dry end. What are the properties of the finished product. But she has been here since day one and prides herself on being one of the first women hourly people hired at the mill. Worked her way to a job that she is proud of. And she knows her job. Only a high school education, but she has spent enough time and knows enough things. She is an authority in her discipline. We get into trouble on the paper machine, the dry end don't measure up. She knows enough about the process that she keeps working her way back up the process until she finds something...Whatever it is, she finds it. She'll let somebody know. Would she do that if she didn't have that incentive check involved in the equation? I don't know. I suspect not based on my experience in other places. If I don't have any motivation other than the weekly paycheck...and I am going to get that paycheck whether this mill runs well or not...it takes a rather unique person, somebody motivated by other forces than pay and job satisfaction. There's got to be pride but there's got to be something beyond the normal for them to even care. I go back to what I said before; when that paper machine is not running, well, it is like there is a sickness in the family, and it is felt all around us.

The gainsharing program also influences performance in another way: through the effects of workforce quality (Quadrant I, center). The incentive bonus program is seen by Operations Manager Russell as enabling CP to “hire and hold high caliber people.” Workforce quality helps leverage the effects of production-focused and maintenance-focused effort. That is, given the same effort, a more skilled, experienced individual or group will more than likely produce more results than an individual or group less skilled and experienced. The ways in which the incentive bonus influences workforce quality, and

the ways in which it influences the perceived need to increase production, reduce lost time, and invest in capability are described in the following section.

5.6.2 HOW GAINSHARING INFLUENCES

The description of how gainsharing influences performance at CP best begins with the incentive bonus calculation. The average daily production (Figure 5-6, Quadrant I, right center) and the incentive schedule (i.e. the incentive base production [Quadrant II, center] and corresponding bonus percentage production increment [Quadrant II, center]) determine the incentive bonus percent earned (Quadrant II, lower left) and eventually paid (Quadrant I, lower right). The average daily production influences bonus expectations (Quadrant II, upper left) and the “line of fairness,” which was mentioned in Section 5.3.

In the words of President Allen, if:

You destroy what that incentive means to the people and the whole house of cards may come tumbling down. Because it provides the ownership in the company for every individual here. And he does not want that ownership diluted by being somewhat of a takeaway. It would be a break of faith if we arbitrarily changed the program so that the payout would drop from 17% or 18% to, let's say, 10%. That would destroy all of the trust that we have built up between everyone of us over the years.

At the time this research was conducted, there was a redesign of the incentive bonus calculation occurring. This redesign was to reflect the increase in production capability toward the capability goal of 1100 tons per day from 700 tons per day. The effects that past incentive bonuses have on any proposed changes to the incentive formula were highlighted by the maintenance manager, who was particularly disturbed by a proposed incentive schedule that portrayed 0% bonuses for certain levels of production. Even

though these levels of production had not been realized for quite some time, Maintenance Manager Daniels told President Allen to “get rid of those damn zeroes” because he did not want it viewed as a takeaway. There was also concern among top managers that the new incentive schedule provide incentive bonuses at the same level presently achieved (again, the average daily production influences bonus expectations). The concern shown and the care taken by top managers in redesigning the incentive program was best captured by Mill Manager Bauer who said:

We have to be very careful on how we handle it, how we present it, how we implement it. Because it's...an emotionally supercharged issue. You go tampering with something like that, let these people believe that you are being casual in how you handle it, that you are insensitive or you tampering with...you are revising chapters in the Bible is what you're doing.

The concern shown and the care taken by top managers when it comes to the incentive bonus was demonstrated at the 4th Working Day Meeting, which I had the opportunity to attend a day prior to the interviews. Almost 20% of that meeting was devoted to the incentive bonus calculation. The energy level noticeably increased, managers became animated, and managers known for not saying much (if anything) at these meetings spoke up. The following day, all the top managers interviewed mentioned that meeting, what went on in regards to the incentive, and in particular manager's reactions. These comments are best represented by Mill Manager Bauer:

Did you see the care with which Dave (the president) presented that yesterday? And maybe you haven't seen him enough on stage, but I will tell you one thing: he put in a lot of energy into that presentation. He was careful. He was controlled. He took the time to develop it. And then did you see the reaction of the audience to the information that he put out there? This thing is a powerful force and I am not sure I fully understand it just yet.

Another example of the concern shown and care taken to ensure the new incentive formula falls on the line of fairness is found in President Allen's presentation of the proposed changes to supervisors. In reading through this presentation, one sees the care taken and concern shown for fairness and understanding.

Section 4.13 contains a full description of the incentive bonus calculation and CP's gainsharing program. However, it is here, with the incentive bonus calculation, that the gainsharing program first begins to influence the perceived need to increase production, reduce lost time, and invest in capability. It does this by affecting the perceived influence on bonus results.

5.6.2.1 The Perceived Influence on Bonus Results

A way in which the incentive bonus influences the perceived need to increase production, reduce lost time, and invest in capability is through the perceived influence on bonus results (Figure 5-6, Quadrant II, lower left). As the latter increases, so do the former. The perceived influence on bonus results is a function of the incentive base production tonnage, the bonus percentage production increment increases, the incentive bonus complexity, and the layers of bureaucracy.

The importance of setting an incentive base production tonnage that is perceived as achievable was mentioned by Maintenance Manager Daniels:

If you put the incentive beyond...reach, or if you don't give something that is doable, you are hurting yourself by trying it. They will say, "Well, we can't do this anyway. There's no way we're going to get there, so why in the hell should I try for it." I mean that's the feelings of the people. That's what's going to happen.

Mill Manager Bauer also talked about the importance of operators believing that the target levels of production are achievable. He used the term “confidence” to describe this belief. That is, the operators have confidence both in the equipment and their ability to produce tons.

Working in concert with the incentive base production tonnage is the bonus percentage production increment. This increment will be adjusted downward to five ton increments from ten ton increments for the upcoming fiscal year. The importance of this change is reflected in the view of Operations Manager Russell:

Because ten ton increments you can't always make. five ton increments is...you know you can get above every five tons rather than every ten. Because sometimes you can't get above the ten. The last couple of months, up until last month, we were above the five ton, but not the ten, and...the company made something off of it, where if you go to five tons...then the people will make something off it.

However, Human Resource Manager Hutchinson and Financial Manager Kohler believed that even though the next bonus percentage may be out of reach toward the end of a month, people work just as hard as if they could reach it. That is, the incentive bonus program has been in effect for so long now that it is not something that people turn off and on just because they can or cannot impact that month's bonus percentage. Even though these two managers believed this to be true, they also believed that the more narrow, five ton spread will still influence behavior because it provides a more reasonable opportunity to affect or preserve a bonus percent. According to both Operations Manager Russell and Maintenance Manager Daniels, employees “definitely strive for one percent.”

Both the operations manager and maintenance manager believed that lost time will show up more with five ton increments than with the ten ton increments. The influence of

lost time on paper machine production was discussed in Section 5.1. In the context of the gainsharing program, an hour of lost time on the paper machine could cost a ton of production, which would translate to a lost percent of incentive. And that one percent, in according to Maintenance Manager Daniels, is “dollars in everybody’s pocket, and they believe that...they know that.” He believes that narrowing the bonus percentage production increment will make lost time more visible.

The perceived influence on bonus results is also influenced by the layers of bureaucracy (see Section 5.5.2). Because there are only three management levels, there is high line-of-sight or line-of-influence between one’s actions at CP and CP’s performance, making the extra effort-extra benefit (i.e. incentive bonus) bargain highly visible. Financial Manager Kohler explained that:

People are more attuned to what they can do when there are problems that affect production, even though it may not be in their department or it may not be on their shift or it may not be right at their control panel. If they feel like they can have an impact on solving that problem, they will do it. Whether it’s physically or through suggestions, they are willing to make that extra effort which is what we kind of tagged the incentive program to do...People really feel they are part of the organization. That they can contribute. That they can make a difference. Whether they can or they can’t, if they feel that way, they are more likely to put forth that effort.

Because the incentive bonus is so closely tied to production, the perceived influence on bonus results is closely tied to the perceived need to increase production and reduce lost time, both in an economical and psychological sense. Operations Manager Russell, in talking about how the incentive affects people, stated:

The guys on the line are really attuned to the incentive because when that machine shuts down for a paper break, those guys...know if they are not all over that machine, correcting or cleaning out the break and getting it started

back up, that they have a direct impact on production. Mechanics can feel the same way about their routine maintenance or when a piece of equipment goes down, knowing that I've gotta work extra hard because every minute that machine is down, I'm losing money, so is everybody else.

However, monetary gain is not the sole reason for the above attitudes and beliefs. All the top managers interviewed believed the perceived influence on bonus results goes beyond economics.

The perceived influence on bonus results is also influenced by the incentive bonus complexity. This understanding is not necessarily a function of education — over 73.2% of the people working at CP have a high school education or above — as it is seeing and feeling the connection between the bonus and performance. President Allen summarized the importance of this feeling in an interesting account of the design of the gainsharing program:

So, we started out with a program that had about five different things that we would monitor, and performance against these five yardsticks would indicate a bonus for the employees. Some of those items we were looking at were safety, housekeeping, production off the paper machine, manufacturing costs as compared to budgeted costs, net sales as compared to projected selling price...As we sat there and looked at these points for measuring performance and how much a bonus the people would receive, one of our Directors said, "Now, listen...we are talking about trust, openness, and here we are talking about five different things to measure whether a person receives a bonus or not, and some of it is subjective, and some of it is based on your accounting books. These people don't have access to your books, and they're not going to believe something they can't see or feel."⁷

⁷This inconsistency is worth commenting on. An underlying reason for family of measures gainsharing approaches may be a lack of trust between management and labor. Management wants to ensure that labor does not game the gainsharing program. However, any measurement system can be gamed. A culture of trust eliminates this gaming.

It is interesting to note that over 16 years ago, CP considered a family of measures gainsharing approach, which is increasing in popularity, and rejected it. Not only did they view it as overly complex, they also viewed it as inconsistent with their guiding principles.

5.6.2.2 The Perceived Need for Incentive

The perceived need to increase production, reduced lost time, and invest in capability are also influenced by the perceived need for incentive (Figure 5-6, Quadrant IV, upper right). As the latter increases, so does the former. The perceived need for incentive increases as the incentive bonus paid increases. Closely related to the perceived need for the incentive is the perceived incentive loss (i.e. the difference between bonus expectations and the incentive bonus percent paid) (Quadrant IV, left center). As it increases, so does the perceived need to increase production, reduce lost time, and invest in capability.

According to Maintenance Manager Russell:

We have people at this mill that if it wasn't for incentive they couldn't pay their bills. That's how important it is for them. That's how they look at the incentive. Not everybody, but if we went through a period of no incentive we got people who would be in bad shape because they live for that incentive...Now, more and more...people are looking at incentives as retirement in the stock savings plan.

All the top managers interviewed stated that there is a certain part of people's lifestyles which depends on the incentive. The use of incentive bonus to supplement retirement is one example. Managers tell stories about people who have sent their kids to college or bought pick-up trucks or bass boats with their incentive bonus earnings.

Regardless of the incentive bonus's use in individual's personal lives, the earnings from the incentive bonus are significant. The incentive bonus averaged 16.4% of pay in

fiscal year 1990, boosting typical earnings and benefits some 15.3% higher than comparison mills. The bonus has averaged 16% the past six years. Not only is the incentive bonus desired by people in the mill, it is expected as an integral piece of total income. Commonwealth Paper's deliberate attempt with the incentive program has been to make people see it as part of their total compensation and to depend on it for income and their financial security. Human Resource Manager Hutchinson, in providing closing remarks at the end of his interview, said:

I think that gainsharing is relative...I see some real puny gainsharing programs in our industry and I don't think they would motivate me to do anything...one percent and two percent additional opportunity and they are in the context where the base wage is lower... If we took incentive away, our folks would be able to say that they're being paid total compensation that is competitive within the industry and benefits like nobody has...So the gainsharing is really the capstone of a total program designed not only to get the employee to work and put forth extra effort, but to give the employee a fundamental realistic sense of security...I don't think that some of these companies that talk about gainsharing where they have reduced pay or the pay is at 2/3 the level...then you get the rest to make up what your competitive wages should be through gainsharing. I don't think that's gainsharing.

This perceived need for the incentive is not only financial in nature, but also psychological, manifesting itself in pride for the incentive bonus. Mill Manager Bauer stated that:

And they understand that 18% bonus is budget...18 percent. I'm going to get an 18% kicker if they do what they say they're are going to do. And we're all motivated to that end. That ain't half bad. 18% over my already decent wage...And their neighbors who work at the foundry or GE...or the retail store or the car dealership say, "Oh you work at Commonwealth Paper. Not only are you well paid but you've got that bonus plan, don't you? Supplemental check four times a year." People in the community may not know how it works, may not know the order of magnitude,

but they know it is significant. And so they know about that bonus plan. The employees are proud of it.

So while there may be various, underlying economic or psychological forces driving the perceived need for the incentive, these economic and psychological forces tend to increase as the bonus percent paid increases (Quadrant I, lower right); these forces manifest themselves in the perceived need for incentive.

5.6.2.3 Labor-Management Polarization

In addition to the perceived influence on bonus results and the perceived need for incentive, the need or desire to increase production, reduce lost time, and invest in capability is also influenced by labor-management polarization (Quadrant III, upper left). The role the incentive bonus plays in reducing labor-management polarization, as an integral part of the compensation system, was briefly discussed in Section 5.3. It also influences labor-management polarization (Figure 5-6, Quadrant III, left) through takeaway fears that result from an incentive bonus payment gap (Quadrant IV, upper right). Recall the story, found in Section 5.2, told by Financial Manager Kohler of the time when CP could not afford to pay the full incentive:

There was also a time, if we go back into the early 80s — the recession we had in 82-83 — when financially the company could not afford to pay incentive and so what we did at that point (was) we maintained the incentive formula the way it was, but for that two years we only paid 25% of what the formula calculated...And we gave them justification to why, financially why— cash flow, profits, the whole picture — we gave them information so they knew why we could not guarantee the money would ever be paid them but we would keep records of what they would have received and what they did receive and if we could ever pay the difference back we would.

Maintenance Manager Daniels explains:

The worst time credibility showed up in this mill was back several years ago...in the early 80s and we held back the incentive, a portion of it, because the company didn't have it and still make the debt...There was four or five months of incentive pay periods we held back by quarters and the President said he'd give the money back. The people — I won't say a majority of the people — was convinced that their incentive was lost. They would never get that incentive back. As the company began to get its head above water, over a period of time, I think four — and I may be wrong on these dates — it was three or four times we made an adjustment. We paid every bit of the incentive back. All the incentive. Now at that point in time, the credibility was low for some of the people, but once that was paid back, the credibility just increased. They realized this company is going to do what it says it will do.

Financial Manager Kohler also had a similar observation:

There were many employees that went up to Dave (the president)...and thanked him and said that they were skeptics when we took it away from them. They never believed that they would get the money and were really appreciative. And probably their loyalty to the company went up a notch because of that.

When asked whether there was less effort expended on people's part during the period of no incentive, top managers said no, because everyone was struggling to improve production performance. Operations Manager Russell did believe that this would not last forever:

...I think the time was coming you would have seen a drop somewhere. Because when the times got good again and the people saw no lost bonus coming back to them, you probably would have seen a drop off.

While the effects of the incentive program manifest themselves in increased production and reduced lost time, these effects are also leveraged by workforce quality, a quality that is defined not only by skill level and experience, but by a set of values that align with CP's culture.

5.6.2.4 Workforce Quality

In regards to skill level and experience, the total reward package, of which the incentive bonus plays a major role, helps CP attract and retain quality people (Figure 5-6, Quadrant I, center). Commonwealth Paper takes a lag strategy in regards to base pay. It considers what comparison mills are paying different jobs, considers the increases in pay for those jobs, and adjusts base pay and premium pay accordingly. Because base pay has begun to stagnate in the paper industry, as unionized mills look for ways to control costs, base pay has also begun to level off at CP. Maintenance Manager Daniels explains:

When the company was in the hole, not making anything, we had to give people ten percent raises. That was the industry trend, the average. Now the average is down. Those ten percent raises are over. There won't be any more of them for years and years and years. We're back into one percent and two percent raises.

The incentive bonus, however, provides CP with the leverage to make their reward package the most attractive in the industry. For this reason, the incentive bonus is seen as helping CP attract and retain quality people. For example, there were 170 applicants for an instrument technician position; 18 were interviewed, and one was hired. Sixty-nine percent of the workforce has been with the company ten or more years (recall that the company itself was started 15 years ago). Financial Manager Kohler, when talking about performance measures at CP, stated that:

It's very difficult to measure, but the things...mentioned that are good measures of our company performance is loyalty, low turnover...They're not necessarily directly tied to the incentive, but the incentive goes a long way to promoting that loyalty and keeping people with the company.

The incentive bonus influences both the quality of people employed and the quality of their effort. The attention given to selection and placement (Quadrant I, upper left) helps ensure the CP has managers and employees that are not only of high quality but philosophically aligned with the culture. When talking with top managers at CP about people, the word "fit" is used quite a bit. They talk of people who "fit our culture." As President Allen explained:

We try to apply the same standards to everyone we hire. The one thing we look for is a person that will fit the culture that we have here. That's the number one judgment before we even look at the individual's technical abilities. We have to ask ourselves, "Does his personality, his nature, his way of operating and beliefs fit our culture?" If the answer is no, then I don't want to know anything else about him. It's easy to find guys that just come in and dictate how the job is to be done. Those are easy to find. Thousands of them. It's hard to find an individual who will take the time to be a team player, to allow people to participate, take the time to communicate.

And in his concluding remarks he again brought up the importance of people who fit the culture:

I would just sum it up by saying this: The key to having an organization with the culture that we have here and have it function and operate like it does today, you start with recruiting. That's very important. It starts with recruiting, and that's at all levels, from the janitor to the president. Because every one of those positions are people who are important when it comes to attitude, belief, and how you

work with other people, how you treat other people, and how you conduct your business with other people.

Commonwealth Paper hires people who want to do a good job and take pride in what they do. And because of the culture that has emerged over the years, this attitude is nurtured rather than stifled.

5.6.3 AVAILABLE DATA FOR INCENTIVE BONUS SECTOR VALIDATION

To assist future research studies, Table 5-5 lists the incentive bonus sector variables and the availability of quantitative historical data.

Table 5-5. Data for Incentive Bonus Sector Validation

Variable	Quantitative, Historical Data	Comments
Figure 5-6, Quadrant I		
Select. and Place. Process Quality		Assumed
Workforce Quality		Surrogate measure.
Ability to Hire, Hold Quality People		Surrogate measure
Financial Ability to Pay Bonus	X	Calculated
Incentive Bonus Percent Paid	X	
Figure 5-6, Quadrant II		
Bonus Expectations	X	Avg. prod. percent
Incentive Bonus Percent Earned	X	
Bonus Percentage Prod. Increment	X	Bonus schedule
Incentive Base Production	X	Bonus schedule
Layers of Bureaucracy	X	Org'l. levels
Incentive Bonus Complexity		Subjective judgment
Influence on Bonus Results		Assumed
Figure 5-6, Quadrant III		
Uncertainty		Assumed
Figure 5-6, Quadrant IV		
Incentive Bonus Payment Gap	X	Calculated
Perceived Need for Incentive		Assumed
Perceived Incentive Bonus Loss	X	Calculated

5.7 MANAGERS' REACTIONS TO THE MODEL

While all the managers interviewed believed the summary narrative that accompanied each of the six model sectors was accurate (see Appendix B, pages 259 to 262), they were confused by the causal diagrams themselves. A number of key issues were raised in regards to this point.

1. How to read the causal diagram. Mill Manager Bauer's reaction was typical with respect to this point: "The diagram has no meaning. I would need training to read it. Then I could do it." Even though instructions were provided, all the managers — including President Allen, Operations Manager Russell, and Maintenance Manager Daniels — were confused as to how to read the system diagrams. For example, Human Resource Manager Hutchinson did not know whether the diagram should be read left-to-right or in a time ordered fashion or some other fashion. He told me that "if he was a football coach, he would give these pictures to the opposing team and tell them it was our playbook." He also felt that how the gainsharing program worked at CP was much simpler than the causal diagrams showed. In regards to this last point, he his right. His contribution — and the other managers' contributions – was one small piece of the larger picture. Each of the causal diagrams is a bringing together of different perspectives.
2. Perceived time required to read the causal diagram. Because the managers were not certain as to how to read the diagrams, they were unwilling to take the time to read through them.
3. The narrative was cryptic, but it made sense. Only summary paragraphs were given these managers to describe each sector. I believed that giving them the

entire findings chapter may overwhelm them because of its size and may bias them.

5.8 THE GAINSHARING PROGRAM'S INFLUENCE ON THREE KEY VARIABLES

The production rate and lost time, together with production capability, are the three major variables which receive attention by managers, operators, and mechanics. For example, if the maximum production capability is limited to a production rate of 2050 feet per minute, and the paper machine is running at 2050 feet per minute with little if any lost time, the focus is on removing the capability roadblock. If, on the other hand, the paper machine is running at 2000 feet per minute with a lot of downtime, managers, operators, and mechanics are no longer thinking about the capability roadblock. Their focus becomes more operational, shifting toward reducing lost time and increasing the production rate.

Closely related to production rate, lost time, and production capability are the three key variables that lie at the heart of production performance at CP: the perceived need to increase production, the perceived need to reduce lost time, and the perceived need to invest in capability. Table 5-6 depicts these three variables and the elements in each of the six model sectors that influence them. A review of Table 5-6 reveals that information sharing (through its influence on perceived performance gaps) and the incentive bonus are the two main driving forces that help ensure a widespread, shared perceived need to increase production, reduce lost time, and invest in capability.

Table 5-6. Influences on Three Key Variables

Model Sector						
Key Variables	Production	Financial Performance	Compensation	Participation	Information Sharing	Incentive Bonus
Perceived need to increase production	Production gap	Budget performance gap Comparison performance gap	Labor-management polarization	Perceived influence on results	Perceived production gap Perceived incentive bonus gap	Perceived influence on results Perceived need for incentive Perceived incentive loss Labor-management polarization
Perceived need to reduce lost time	Lost time gap Production gap		Labor-management polarization	Perceived influence on results	Perceived lost time gap	
Perceived need to invest in capability	Capability gap		Labor-management polarization	Perceived influence on results	Perceived capability gap	

6.0 A GENERAL MODEL OF HOW GAINSHARING AFFECTS ORGANIZATIONAL PERFORMANCE

This chapter presents: 1) the underlying system structure of the site-specific model; 2) a comparison of the causes and effects found in the site-specific model and the causes and effects hypothesized in models and studies found in the gainsharing literature; 3) a hypothesized, general model of how a gainsharing program impacts organizational performance based on the site-specific model and the gainsharing literature; and 4) ten hypotheses, based on model comparisons, on how a gainsharing program may affect organizational performance.

6.1 THE UNDERLYING STRUCTURE OF THE SITE-SPECIFIC MODEL

The site-specific model, presented in Chapter 5, provided insight into two questions: (1) What organizational performance variables and relationships does a gainsharing program affect? and, (2) How are they affected? The gainsharing program at Commonwealth Paper (CP), in combination with information sharing (through its influence on perceived performance gaps), worked to ensure a widespread, shared perceived need to increase production, reduce lost time, and invest in production capability. These perceived needs led to actions that influenced the three major variables at the heart of production performance at CP: 1) the production rate, 2) lost time, and 3) production capability. Through creating many of the conditions that affect the perceived need to increase production, reduce lost time, and invest in production capability (see Section 5.8), the

gainsharing program at CP provided the additional pressures or forces necessary to achieve performance goals.

It was originally thought that the site-specific model sectors — with the exception of the performance impact sectors (in this case paper production and financial performance) — would follow what is commonly referred to as a “limits to growth” structure (see Senge, 1990).¹ While there are limits present in each of the model sectors (i.e. goals, resources, norms), it became clearer as the research evolved that when trying to understand how gainsharing works to affect organizational performance, it was the structure of the production sector that mattered. That is to say, it became more obvious to the researcher that one first needs to understand the variables and relationships which affect performance before one can understand how a gainsharing program (or any other management program) works to affect performance. This makes sense if one considers the intended purpose of management policies and programs — to improve organizational performance. The main effects of the other sectors in the site-specific model manifest themselves in the production sector. Therefore, it is the structure of the production sector and the gainsharing program’s influence on that structure, that is important.

The production sector follows a system structure known as an “eroding goal” structure (see Senge, 1990). The eroding goal structure is depicted in Figure 6-1. Whenever there is a gap between actual performance and a performance goal, two pressures are exerted: 1) pressures to improve conditions and 2) pressures to adjust the goal.² Information sharing influences perceptions of these performance gaps. While the

¹ See Appendix C for a description of the limits to growth structure.

²An eroding goal structure is analogous to Lewin’s (1951) concept that people, and the organizational structures, systems, and processes in which they work and live, are embedded in a force-field. Movement (or change) within this field is a function of the strength of driving forces in relation to the strength of restraining forces. Examples of eroding goal structures are common. For example, manufacturers let due dates slip when

perceived need to close the performance gap is influenced in part by the size of the gap itself, it is the gainsharing program which provides the additional pressures or forces necessary to avert eroding goals. The gainsharing program not only provides increasing pressure to close performance gaps, but it also provides increased capacity to hold goals when there are production problems. It also provides increasing pressure to continually strive for higher goals because the achievement of higher goals translates to higher incentive bonuses.

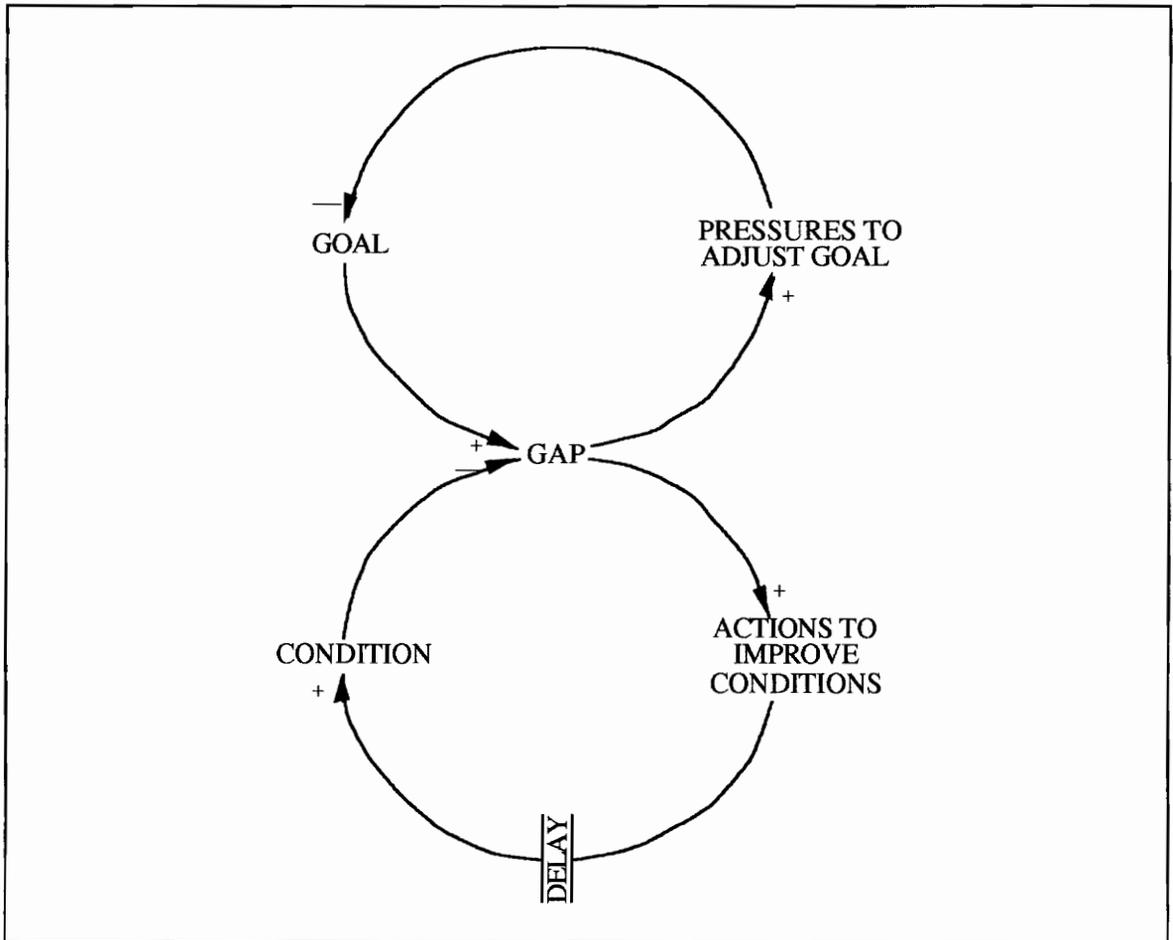


Figure 6.1 The Eroding Goal Structure (Senge, 1990).

production orders increase; elected officials raise acceptable unemployment or inflation levels when the economy declines.

6.2 A COMPARISON OF THE SITE-SPECIFIC MODEL WITH THE GAINSHARING LITERATURE

To control the amount and quality of secondary data considered, only those gainsharing case studies, empirical studies, and review/integrative/theoretical studies considered by White (1979) or the researcher as an objective study were used for comparison purposes (see Appendix A, Table A-2, page 239, and Section 3.5.1). First, the site-specific model was compared to the existing gainsharing frameworks and models (see Section 2.3). Second, the site-specific model was compared to causes and correlates of success identified in gainsharing studies (see Section 2.2).

6.2.1 A Comparison with Existing Frameworks and Models

When comparing the gainsharing literature with the site-specific model, it is important to keep in mind that there is no standard definition of a gainsharing program. Up until the past five to ten years, the literature has been biased toward Scanlon Plans, but other types of gainsharing programs have also been documented. There are also no standard definitions for gainsharing-related concepts. Because many of the causes and correlates of success found in the gainsharing literature lack common definitions, there is some differences in terminology among these models and between these models and the site-specific model. These differences, however, did not pose a major problem in matching these models' causes and correlates of success with the causes found in the site-specific model.

Table 6-1 compares causes and correlates of success hypothesized in existing gainsharing frameworks and models with those found in the site-specific model (for a description of the frameworks and models shown in Table 6-1, see Section 2.3). Table 6-2

Table 6-1. Site-Specific Model Compared to Causes and Correlates of Success
Causes and Correlates of Success Hypothesized in Gainsharing Frameworks and Models

Site-specific model sector	White (1979)	Bullock and Lawler (1984)	Graham-Moore and Ross (1983)	Florkowski (1987)	Hammer (1989)
Production	<ul style="list-style-type: none"> • Technology 	<ul style="list-style-type: none"> • Objectives • Union organization 	<ul style="list-style-type: none"> • Technology • Policy • Internal system attributes 	<ul style="list-style-type: none"> • Technology 	<ul style="list-style-type: none"> • Identification of and solutions to problems • Goal setting • Improved planning, organization of work
Financial Performance		<ul style="list-style-type: none"> • Environment favorable 	<ul style="list-style-type: none"> • External environment • External system attributes 		
Compensation	<ul style="list-style-type: none"> • Managerial climate 	<ul style="list-style-type: none"> • Employees involved 	<ul style="list-style-type: none"> • Climate • Reward structure • Union and industrial relations 	<ul style="list-style-type: none"> • Perceived pay equity 	
Participation	<ul style="list-style-type: none"> • Size • Management attitudes 	<ul style="list-style-type: none"> • Involvement structure • Size • Management style 	<ul style="list-style-type: none"> • Size • Managerial philosophy 	<ul style="list-style-type: none"> • Participation forms • Org'l. structure 	<ul style="list-style-type: none"> • Redefined work-effort bargain • Participation • Employee empowerment
Information Sharing	<ul style="list-style-type: none"> • Prompt and usable feedback on performance 				<ul style="list-style-type: none"> • Information sharing
Incentive Bonus	<ul style="list-style-type: none"> • Size • Workforce Characteristics 	<ul style="list-style-type: none"> • Target • Productivity focus • Employee distribution • Payout period • Size • Interventionist used • Employees favorable 	<ul style="list-style-type: none"> • Size • Identity • Workforce Char. • Trust • Control • Motivation 	<ul style="list-style-type: none"> • Financial participation • Perceived importance • Perceived line-of-sight • Org'l. structure • Org'l commitment • Executive, supervisor, employee support • Union support • Job satisfaction 	<ul style="list-style-type: none"> • Bonus payments • Trust in management
Not included in any model sector	<ul style="list-style-type: none"> • Program expectations • Age of program • Balanced emphasis on non-financial aspects 				

Table 6-2. Site-Specific Model Compared to Gainsharing Program Outcomes

Program Outcomes Hypothesized in Gainsharing Frameworks and Models						
Site-specific model sector	White (1979)	Bullock and Lawler (1984)	Graham-Moore and Ross (1983)	Florkowski (1987)	Hammer (1989)	
Production		<ul style="list-style-type: none"> Organizational effectiveness 		<ul style="list-style-type: none"> Improved productivity Improved quality 		
Financial Performance				<ul style="list-style-type: none"> Improved financial performance 		
Compensation		<ul style="list-style-type: none"> Labor-management cooperation Increased pay 		<ul style="list-style-type: none"> Improved labor-management climate 		
Participation		<ul style="list-style-type: none"> Innovation 			<ul style="list-style-type: none"> Identification of and solutions to problems Improved planning and organization of work Intrinsic motivation Empowerment 	
Information Sharing						
Incentive Bonus				<ul style="list-style-type: none"> Lower turnover 	<ul style="list-style-type: none"> Trust in management Commitment to the plan 	
Not included in any model sector		<ul style="list-style-type: none"> Quality of Work Life Program success (i.e. continuation) 		<ul style="list-style-type: none"> Lower absenteeism Employment stability/growth 		

compares the program outcomes hypothesized in these models with those found in the site-specific model. A review of Tables 6-1 and 6-2 provided the following eight findings:

First, there is a greater level of detail shown in the site-specific model than is shown in any of the theoretical frameworks or models. The detail found in the site-specific model was necessary to uncover a fundamental insight: that one first needs to understand the variables and relationships which affect performance before one can understand how a gainsharing program (or any other management program) works to affect performance. All the existing frameworks and models of gainsharing have been primarily built from literature reviews, not site-specific data, and are correlational, not causal. These models, therefore, take a “black box” approach to organizational performance variables and relationships. An enhanced understanding of how a gainsharing program works to affect organizational performance could be obtained if organizational performance variables and relationships were made explicit.

A second finding, somewhat related to the first, is that only two models — Bullock and Lawler (1984) and Graham-Moore and Ross (1983) identify the influence that external, financial performance variables exert on a gainsharing program. Because most of the studies documented in the gainsharing literature are limited to the first or second year of implementation, the influence of financial performance variables may not have manifested themselves during the time these studies were conducted. The site-specific model, on the other hand, considers a 15 year history of the gainsharing program at CP. Because of CP’s early production problems and debt problems, and because the product produced is a commodity, the influence of financial performance variables was always present.

Third, quality labor-management relations seems to be both a necessary precondition for program success and a program outcome. For example, Hammer (1988) shows trust in management as an outcome of information sharing and bonus payments, and

also a cause of participation. Likewise, the site-specific model shows that both information sharing and the incentive bonus influence labor-management relations. The role played by the incentive bonus in the site-specific model, however, differs somewhat from the role it plays in these other models. In the site-specific model, it is not the incentive bonus per se that influences labor-management relations, but rather the consistency with which incentive bonuses earned are paid. In addition, only one model, that of Graham-Moore and Ross (1983), recognizes the influence of the total reward or compensation structure. For example, Florkowski's (1987) model identifies pay equity as an important variable, but only in the context of the bonus earned, not in the context of total reward. In the site-specific model, the compensation structure, by minimizing manager-employee reward gaps, plays a key role in the quality of labor management relations.

Fourth, all five models identify participation as a critical variable in gainsharing program success. Yet in the site-specific model, participation plays a diminished and somewhat unclear role. There are at least two reasons for this. One possible reason is that the gainsharing programs on which these other models are based included a formal participation component. Commonwealth Paper's gainsharing program, on the other hand, was designed as one piece of an overall participative environment. There was no formal participative program attached to it. The other possible reason is that CP has just begun, in the past three years, to move toward more fully implementing formal participation. As mentioned in Section 5.4, there has always been a type of "informal participation" at CP. Because top managers are still learning how to make formal participation work, they may not have considered how participation relates to the gainsharing program. The relationship between the gainsharing program and participation, therefore, was not articulated by these managers in the interviews.

While there is disagreement between the existing models and the site-specific model concerning the importance of participation to the gainsharing program's influence on performance, there is agreement between three of the models and the site-specific model in regards to management style (or attitudes or philosophy). White (1979), Bullock and Lawler (1984) and Graham-Moore and Ross (1983), as well as the site-specific model, recognize the influence that management style exerts on the desired and actual level of involvement.

Fifth, information sharing has received scant attention in all but two of the models, whereas it is considered a critical component of the site-specific model. (It could be the case that CP managers inflated the importance of information sharing because they have always believed that information sharing is important. However, the finding that information sharing is important is not unique to CP [see Kanter, 1983; Lawler, 1986]). White (1979) specifically identifies prompt and usable feedback as a critical cause of gainsharing program success whereas Hammer (1988) simply identifies information sharing. There are two possible reasons for the lack of attention to information sharing in these models. One possible reason— and this is a difficulty I encountered when trying to portray the variables and relationships in the information sharing sector — the effects of information sharing are less tangible, less visible, and more subtle than, for example, participation or the gainsharing bonus itself. Another possible reason is, because gainsharing programs are performance-measurement based, a certain level of information sharing is implicit in the design of the program itself. Therefore, the effects of information sharing may be interpreted as effects of the gainsharing bonus.

Sixth, with the exception of Hammer's (1988) model, all the models identify size as a critical variable in influencing gainsharing program success, through its effect on perceptions of impact on results (or line-of-sight). The site-specific model suggests that a

size-dependent variable, the number of organizational levels (or layers of bureaucracy), influences perceived impact on results. It should be noted that CP is a high “line-of-sight” environment. The fact that there is a single production process and a single product type (corrugating medium) produced may account for this line-of-sight more so than organizational levels. Because CP’s organizational structure is based on this production process, it is difficult to determine whether process or structure (or both) is the key, influential variable.

The size variable may offer another possible explanation as to why participation received less emphasis at CP than it does in the gainsharing literature. Because CP is such a high line-of-sight work environment, formal participative processes may not be needed to establish a connection between contribution and results. This line-of-sight already exists. In fact, it may be the case that it is not participation per se that is important, but the role it plays in creating or influencing line-of-sight perceptions. In other words, in lesser line-of-sight work environments, formal participative processes are needed to provide a perception of influence over results. The gainsharing bonus, in combination with participation, establish line-of-sight, regardless of whether the participation had any real impact. If managers and workers perceive themselves as having an influence on results, that perception has real consequences for those people.

Seventh, with the exception of quality of work life, absenteeism, and employment stability and growth, all the outcomes hypothesized in the existing models are found in the site-specific model.³ Turnover, a measure associated with both quality of work life and

³It is important to keep in mind that when dealing with the dynamic complexity found in organizational life, labeling a variable as a cause or as an effect is more a conceptual distinction than a real distinction. One of the underlying assumptions of this study was that it is not possible to establish causality in any final and absolute sense when dealing with the complexities of real programs in which treatments and outcomes are never quite pure, single, and uncontaminated (Patton, 1986; Suchman, 1967). However, it is possible to

employment stability, is implicit in the incentive bonus sector of the model. While absenteeism was not identified as an outcome of the incentive bonus at CP, absenteeism performance would be considered good (see Section 4.7, Table 4-1). In regards to employment growth, since its beginning, CP has almost doubled in size in terms of employment and have never had a layoff, either temporary or permanent.

Eighth, how the gainsharing program is managed is missing from the site-specific model. Implementation issues are a focus of White's (1979), Bullock and Lawler's (1984), and Florkowski's (1983) model. As mentioned above, most of the studies on which these models were built were conducted during the first or second year of implementation when implementation issues are a major concern. Commonwealth Paper's gainsharing program has been in place for 15 years. When there have been redesigns, implementation issues are considered (see Section 5.6.2.). However, the purpose of the site-specific model was not to portray how a gainsharing program is managed, but rather how it works to affect organizational performance. The management of the gainsharing program is the approach to these variables and relationships, not in the variables and relationships themselves. This distinction will be made clearer in the following section.

6.2.2 A Comparison With Gainsharing Studies

Table 6-3 lists the gainsharing studies compared to the site-specific model (see Appendix A, Table A-2, pages 239 to 249 for a description of each study). The number listed before each study was used in place of the author's or author's name in matching the causes and correlates of success identified in the study with those found in the site-specific model. Table 6-4 lists the gainsharing studies that were omitted from the comparison even though they were objective studies.

arrive at some reasonable estimate that particular treatments have certain effects (see Section

Table 6-3. Gainsharing Studies Compared to Site-Specific Model

Study Type	Study
Case Study	1. Northrup and Young, 1968; 2. Gilson and Lefcowitz, 1957; 3. Jehring, 1967; 4. Gray, 1971; 14. Driscoll, 1979; 15. Bullock and Bullock, 1982; Rauglas, 1985; Jewell and Jewell, 1987
Empirical Study	5. Wallace, 1971; 6. Burnett, 1973; 7. NCPQWL, 1973; 19. White, 1979; 20. GAO, 1981; 21 Schuster, 1983; 22. Schuster, 1984; 23. Ross, Hatcher, and Adams, 1985; 24. GAO, 1986; 25. Miller and Schuster, 1987; 26. Levine and Tyson, 1990
Review/ Theoretical/ Integrative	8. Strauss and Sayles, 1952; 9. Puckett, 1958; 10. 1962; 11. Ross and Jones, 1972; 12. Geare, 1976; 13. Frost, 1978; 27. Ross and Hauck, 1984; 28. Schuster, 1987

Table 6-4. Studies Omitted from Comparison

Reason for Omission	Study
No causes or correlates of success identified	Tait, 1952; Iman, 1972; Goodman, Wakeley, and Ruh, 1972; Greenwood, 1977; Goodman, 1973; Woods, 1989; Rosenberg and Rosenberg, 1980; Mohrmann, Ledford, and Demming, 1987; O'Dell and McAdams, 1987; Mitchell, Lewin, and Lawler, 1990; Weitzman and Kruse, 1990; Hauck, 1982; Miller and Schuster, 1987; Thor, 1987
Emphasis on preparation prior to implementation	Thierry, 1973
Primary emphasis on labor-management relations	Schuster, 1985

Comparing case study, empirical study, and review/theoretical/integrative study findings with the site-specific model proved to be a difficult and frustrating task. Many of the concepts used in the gainsharing literature have not been given definitions. In most cases, a concept's meaning must be inferred from its use. This inference may or may not

1.4).

be correct. In addition, matching words to a picture (i.e. the site-specific model) requires interpretation because the words are acontextual while the variables depicted in the site-specific model are not. A variable in the site-specific model has meaning because of its relationship with other variables in the model. Despite these difficulties, a number of interesting findings emerged.

First, there are two types of causes and correlates of success identified in gainsharing studies. These two types of causes and correlates of program success are not differentiated in the gainsharing studies and only became apparent as I was attempting to match gainsharing study causes and correlates to those in the site-specific model. The first type deals with gainsharing program management, with an emphasis on program implementation. Table 6-5 lists the causes and correlates of gainsharing program implementation success found in the gainsharing literature. The second type, which is of interest here, deals with how gainsharing works to affect performance. Figures 6-2 through 6-7 — which are shown and discussed below — show the matching of this second type of causes and correlates with the variables and relationships found in the site-specific model sectors. There are more causes and correlates of the first type than of the second type.

A review of Figures 6-2 and 6-3 revealed a second finding: organizational performance variables and relationships in the context of a gainsharing program, including financial performance variables, received little attention in gainsharing studies. Only two studies — Puckett (1958) and Schuster (1987) — identify the production process as a

Table 6-5 Causes and Correlates of
Gainsharing Program Implementation Success

Study	Causes and Correlates of Success
8. Strauss and Sayles, 1952	<ul style="list-style-type: none"> • Rank and file support for union leadership
10. Helfgott, 1962	<ul style="list-style-type: none"> • Enthusiastic union and management support • Segregation of gainsharing and collective bargaining effort • Efforts to educate supervisors
12. Geare, 1976	<ul style="list-style-type: none"> • “Intelligent, enlightened, and energetic” top management and union officials
13. Frost, 1978	<ul style="list-style-type: none"> • Need to delineate and articulate organization’s mandate
14. Driscoll, 1979	<ul style="list-style-type: none"> • Conservative political structure • Management acceptance of collective bargaining • Support of top management and union leaders • Separate commitment from management, union, and workers • Specialized working group to solve production problems
17. Jewell and Jewell, 1987	<ul style="list-style-type: none"> • Quality of management and culture • Management beliefs and values • Degree of fit with other dimensions of the change process • Management willingness to allocate resources for design and implementation
19. White, 1979	<ul style="list-style-type: none"> • Number of years with program • Expected level of success
20. GAO, 1981	<ul style="list-style-type: none"> • Management commitment and dedication
21. Schuster, 1983	<ul style="list-style-type: none"> • Involved union leadership • Education and training • Stimulus for change
22. Schuster, 1984	<ul style="list-style-type: none"> • Management and union acceptance • Corporate encouragement • Desire of management to improve through gainsharing • Training programs • Suggestion acceptance rate • Job restructuring • Role of consultant in bonus plan development • Coordination of implementation by supervisors
25. Miller and Schuster, 1987	<ul style="list-style-type: none"> • Willingness of middle managers to commit
26. Levin and Tyson, 1990	<ul style="list-style-type: none"> • Guarantee of workers’ rights
27. Ross and Hauck, 1984	<ul style="list-style-type: none"> • Top management commitment • Adequate planning and expectations • Middle management and foreman support • Realistic expectations • Absence of major threat to job security
28. Schuster, 1987	<ul style="list-style-type: none"> • Defined program strategic objectives • Sufficient time to feasibility assessment, plan design • Commitment to concept at all management levels • Effective implementation

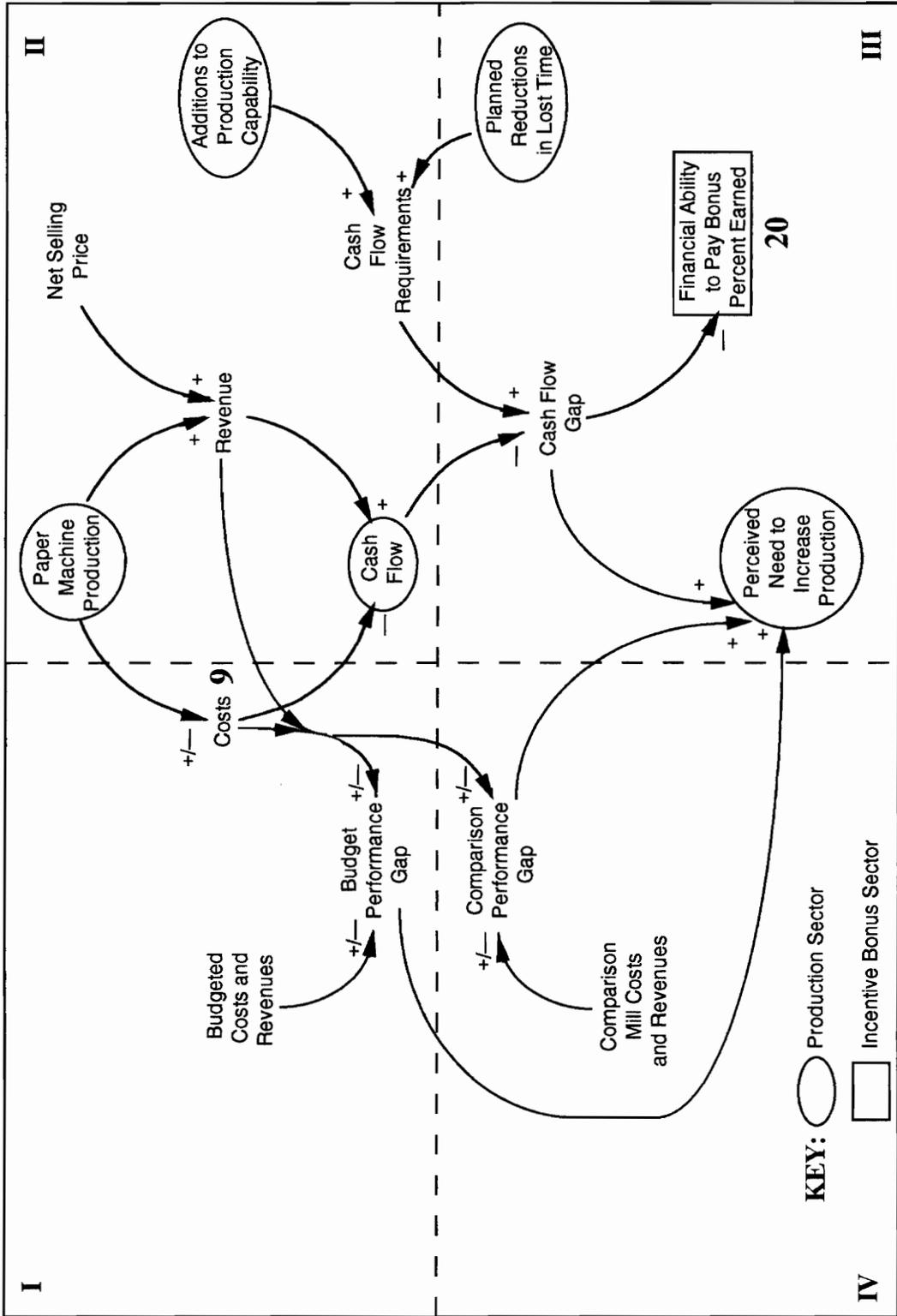


Figure 6-3. The Financial Performance Sector Compared to Gainsharing Studies

cause or correlate of success, and only one study — GAO (1981) — identified difficulties in paying the gainsharing bonus as a cause or correlate of failure. This lack of attention to performance variables and relationships is most likely due to a failure on the part of researchers to first understand the variables and relationships that influence organizational performance before trying to understand how gainsharing works to affect performance.

Third, the role of a gainsharing program in the context of the total compensation system is mostly ignored in gainsharing studies (see Figure 6-4). This finding lies in sharp contrast to the way in which the gainsharing program is treated at CP: as an integral component of the total compensation system. There are at least two reasons why gainsharing studies have ignored the role of total compensation in the context of a gainsharing program. One reason is there may be no interaction effects between a gainsharing program and base pay and benefits. This, however, seems unlikely given the fact that most gainsharing programs calculate and pay bonuses as a percent of base pay. The other, and more likely reason, is that in the organizations where these studies were conducted, the gainsharing program was added-on to the existing compensation system (see Kanter, 1989). As such, it may be viewed and treated by managers as an entirely separate and distinct system.⁴

Fourth, while quality labor-management relations was identified as a cause or correlate of success in eight studies (see Figure 6-4), its relationship to gainsharing is not clear. It is also not clear from these gainsharing studies whether labor-management relations is best labeled a cause and correlate of successful gainsharing program

⁴The compensation system in these gainsharing studies is similar to participation at CP (see Section 6.2.1). Because top managers are still learning how to make formal participation work, they may not have considered how participation relates to the gainsharing program. The relationship between the gainsharing program and participation, therefore, was not articulated by these managers in the present study. The same may be true with respect to the compensation system in these other gainsharing studies.

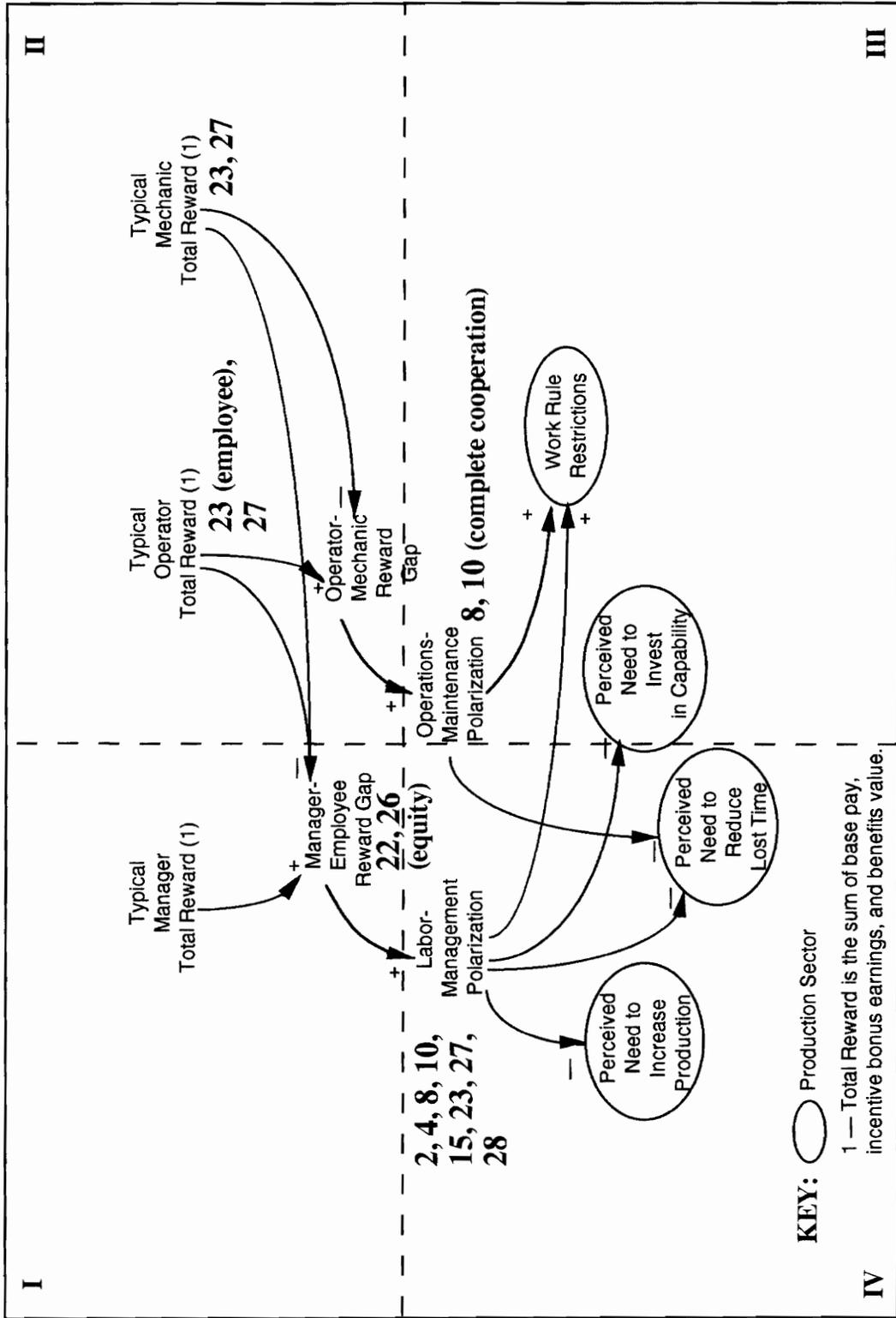


Figure 6-4. The Compensation Sector Compared to Gainsharing Studies

management and implementation or a cause and correlate of how gainsharing works to affect performance. For example, causes like management support or union support both influence and are influenced by labor-management relations. In the site-specific model, labor-management relations (represented by the concept “labor-management polarization”) were influenced by information sharing, reward gaps, and bonus payment credibility (bonus payments equal to bonus earned) and influenced the perceived need to increase production, reduce lost time, and invest in capability.

Fifth, a number of variables that comprise the participation sector received support in the literature (Figure 6-5). Management style, and a closely related variable, desired level of involvement, were identified in seven studies. Size was identified in four studies. Similar to the theoretical frameworks and models, participation seems to be more important in the gainsharing programs that were the subject of these studies than it was at CP.

Sixth, information sharing or communication was identified by a number of studies as important in the context of a gainsharing program, but like labor-management relations, it is not clear exactly what its role is (see Figure 6-6). As mentioned in Section 6.3.1, the effects of information sharing may be less tangible, less visible, and more subtle than, for example, participation or the gainsharing bonus itself. The effects of information sharing may go unnoticed or may be interpreted as effects of the gainsharing bonus itself.

Seventh, incentive bonus complexity (or conversely, incentive bonus understanding) is the variable that receives most attention in gainsharing studies (see Figure 6-7). As incentive bonus complexity increases, understanding decreases, and the line-of-sight between efforts, results, and rewards decreases.

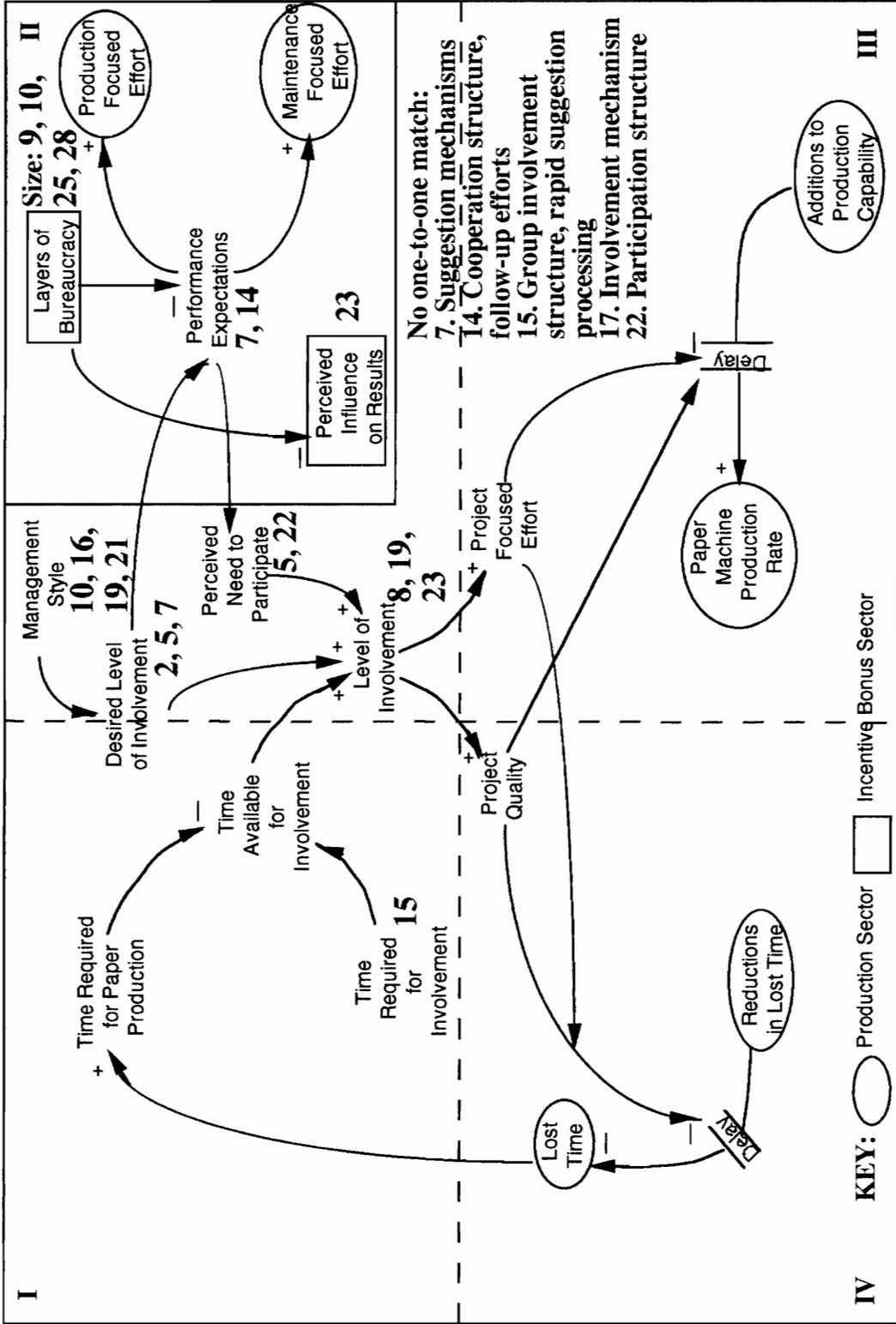


Figure 6-5. The Participation Sector Compared to Gainsharing Studies

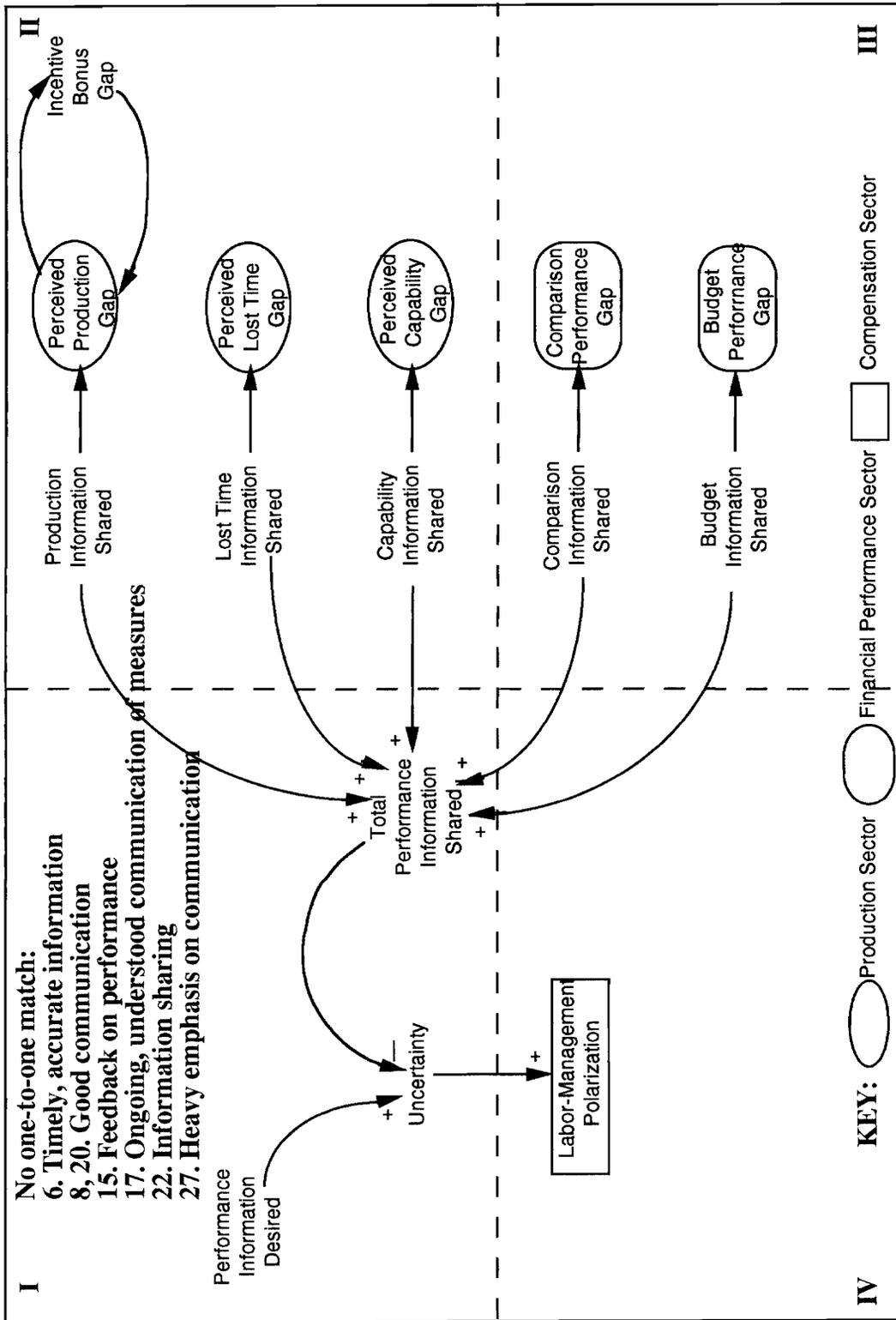


Figure 6-6. The Information Sharing Sector Compared to Gainsharing Studies

6.3 A HYPOTHESIZED, GENERAL MODEL

Figure 6-8 depicts a hypothesized, general model of how gainsharing works to affect organizational performance. The model shows how gainsharing — in combination with information sharing — works to thwart eroding goals (Quadrant I). Gainsharing does this by creating the conditions or forces that influence the perceived need to improve performance (Quadrant I, lower left). These forces for improving performance overcome the forces for lowering performance goals.

The perceived need to improve performance leads to actions to improve performance (Quadrant IV, top center). These actions range from work methods improvement to capital investment, and include formal participation in problem-solving and decision-making. Participation is, in a broad sense, an action to improve performance. Work practice restrictions (Quadrant IV, upper right) place limits on these actions, as does improvement capacity (Quadrant IV, center). Improvement capacity, for example, in the site-specific model, was determined by available cash flow. Another example of improvement capacity is the quantity of improvement proposals that can be implemented during a given time period.

Work practice restrictions are influenced by labor-management goal alignment (Quadrant III, upper left; also Quadrant II, upper right). The term “goal alignment” was used in place of “polarization” or “cooperation” because it better denotes related concepts like togetherness and partnership. Labor-management goal alignment is influenced by the perceived manager-employee reward gap (Quadrant III, right center) and the trust in the gainsharing program (Quadrant III, left center; also Quadrant II, top center). As the management-labor reward gap grows, labor is less likely to feel like “we are all in this together.” Trust in the gainsharing program is mostly a function of credibility: Was the

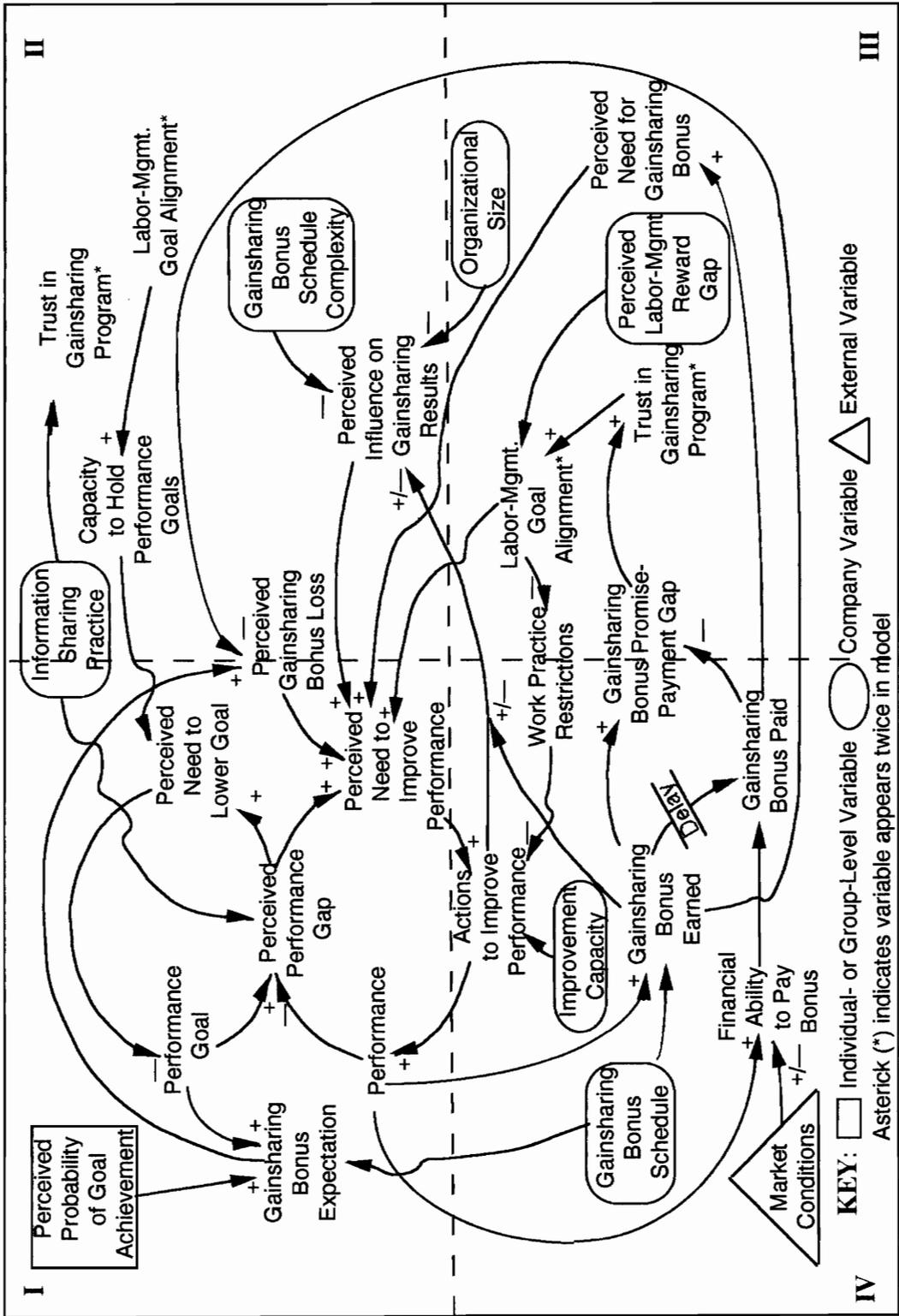


Figure 6-8. Hypothesized General Model

gainsharing bonus earned paid in full (Quadrant IV, right)?⁵ The financial ability to pay the gainsharing bonus earned plays a role here (Quadrant IV, bottom center).⁶

Where labor's goals and management's goals are the same (or perceived as the same), the likelihood that both labor and management are working toward the same end is increased. That is, there is a shared, perceived need to improve performance. In this sense, labor-management goal alignment also influences the organization's capacity to hold goals (Quadrant II, upper left). Poor labor-management relationships often take on a life of their own, distracting individuals and groups from the organization's broader purpose and goals. The organization's capacity to hold performance goals is lessened because of the energy spent on labor-management conflict.

The perceived need to improve performance is a function of the perceived performance gap (Quadrant I, center), the perceived gainsharing bonus loss (Quadrant II, left center), the perceived need for the gainsharing bonus (Quadrant III, right center), and the perceived influence on gainsharing results (Quadrant II, bottom center). The term "perceived" is used here because of the subjective and information-based nature of these constructs. The perceived performance gap and the perceived gainsharing bonus loss are two related variables. The performance goal (Quadrant I, left center), in combination with

⁵The researcher was a participant in a gainsharing program where the top manager continually adjusted the bonus payout. As a result, the program lacked credibility. Eventually, this credibility problem manifested itself in little-to-no buy-in of the top manager's goals and objectives.

⁶There is a philosophical dimension operating here that is important yet difficult to capture in this model. For example, because top managers at CP believe the gainsharing program is the "cement" that holds the company together, they have paid full bonuses when the company was losing money. In Section 5.2 the story was told of the CP's financial problems during the 1982-83 recession. Because of these problems, CP could only afford to pay 25% of the full bonus earned, with the promise that the remaining bonus monies would be paid once financial conditions improved. By 1985, all the bonus money earned during the recession period was paid out. The reason CP did this was because they believed it was the right thing to do. There are organizations who would not have done this.

the perceived probability of goal attainment (Quadrant I, upper left), establishes a gainsharing bonus expectation (Quadrant I, lower left). When actual performance falls short of the performance goal, there is both a perceived gainsharing bonus loss and a perceived performance gap (Quadrant I, center). Whether an individual's or group's focus is directed toward closing the performance gap or recovering the gainsharing bonus loss or both, the end result is the same: an increased, perceived need to improve performance (Quadrant I, lower right).

The perceived need for the gainsharing bonus (Quadrant III, right center) and the perceived influence on gainsharing results (Quadrant II, bottom center) most likely interact in a multiplicative relationship to influence the perceived need to improve performance. The perceived need for the gainsharing bonus is influenced by the size of the gainsharing bonus paid (Quadrant IV, lower right). As the gainsharing bonus increases as a percentage of total pay, so does the personal financial need for it. The perceived influence on gainsharing results is a function of gainsharing bonus schedule (or formula) complexity (Quadrant II, right center), organizational size (Quadrant III, upper right), and the relationship between actions to improve performance (Quadrant IV, top center) and the gainsharing bonus earned (Quadrant IV, center). Gainsharing bonus schedule complexity is most likely a function of the number of measures used, but not necessarily so. As the number of measures increase, so does the number of causal relationships that individuals and groups need to understand. However, a single measure that is indirectly tied to value-adding activities or portrayed in a different organizational language (for example, in financial terms rather than physical quantities) can result in the same type of confusion. Again, if individuals perceive they have an influence on results, that perception is reality. As organizational size increases, the relationship between an individual's or group's actions and performance results becomes more difficult to establish. At a minimum, a critical mass

of organizational members must perceive a moderate to strong, positive correlational relationship between actions to improve performance and the gainsharing bonus earned. If this relationship is considered spurious, the gainsharing bonus will be viewed as uncontrollable or a “lottery” and the perceived need to improve performance will decrease.

6.4 HYPOTHESES DERIVED FROM THE MODELS

Based on the site-specific model and the general model, a number of hypotheses can be stated in regards to how a gainsharing program works to impact organizational performance:

- H1. Gainsharing creates a shared perceived need to improve performance. This shared perceived need to improve performance helps thwart eroding goals.
- H2. The perceived need to improve performance increases as the perceived:
 - a. performance gap increases
 - b. gainsharing bonus loss increases
 - c. need for the gainsharing bonus increases
 - d. influence on gainsharing results increases
- H3. Information sharing creates shared, performance gap perceptions.
- H4. As the perceived gainsharing bonus loss increases, the perceived need to improve performance increases.
 - a. Gainsharing bonus expectations are influenced by the perceived probability of performance goal achievement.
- H5. The perceived need for the gainsharing bonus increases as the gainsharing bonus paid increases.
- H6. The perceived influence on gainsharing results increases:

- a. as formal participation in problem-solving and decision-making increases.
- b. organizational size decreases.
- c. gainsharing bonus complexity decreases.

H7. Formal participation in low-line of sight environments is more critical to shaping perceptions of influence on gainsharing results than it is in high line-of-sight environments.

H8. Actions to improve performance increase as:

- a. improvement capacity increases.
- b. work practice restrictions decrease.

H9. As labor-management goal alignment increases, the capacity to hold performance goals increases.

- a. As trust in the gainsharing program increases, labor-management goal alignment increases.
- b. As the perceived management-labor reward gap increases, labor-management goal alignment decreases.

H10. Trust in the gainsharing program increases as the gainsharing bonus promise-payment gap decreases.

7.0 CONCLUSIONS

Chapter Seven presents the knowledge gained from the research study: 1) general insights; 2) implications for gainsharing program design; 3) modeling issues, and 4) directions for future research.

7.1 GENERAL INSIGHTS

This research study provided three general insights: 1) the complexity associated with modeling organizational phenomena, 2) how gainsharing works to affect organizational performance, and 3) the levels at which management programs like gainsharing should be studied.

7.1.1 Complexity Associated With Modeling Organizational Phenomena

When attempting to create causal models of organizational phenomena like gainsharing programs, one quickly comes face-to-face with the dynamic multiplicity of structures, systems, processes, histories, and people that comprise an organization, all superimposed on and interacting with one another. The challenge is not so much in getting people to talk about some particular organizational phenomenon — a single day of interview data can prove overwhelming — as it is to neatly and accurately portray what they have said. And when that particular phenomenon is deeply embedded in the everyday ebbs and flows of organizational life, it becomes even more difficult to neatly ferret out

effects and causes. Such was the case at Commonwealth Paper (CP). The gainsharing program was not something that appeared one day and was “bolted on” the organization; it has always been there. And while it has some defining features like a bonus formula, it also lacks definitive boundaries, permeating organizational life at CP in ways that are not fully comprehensible. It is little wonder that President Allen referred to the gainsharing program as “the cement that holds the whole partnership together,” or that Human Resource Manager Hutchinson called it a “bonder,” or that Mill Manager Bauer called it a “curiosity.”

To mention all this is in no way intended to make excuses for any shortcomings in the site-specific model presented in Chapter Five. Rather, the purpose in saying all of this is two-fold. First, models, with their neatly drawn boxes and arrows, often create the illusion that things are cleaner and neater than they really are. The reader should not forget the reality which the site-specific model attempts to represent. Because the development of a causal model requires a level of discipline not required in the development of correlational models (which do not attempt to establish causation), the complexity and subtleties of organizational reality is never far from the model builder’s thoughts. Second, other researchers who wish to use this model to compare with or to extend their own site-specific results should remember that organizational reality is in part subjective and emerging. Repeating the research methodology at CP at a later time may lead to different results. The site-specific model that was created in this research was at best a snapshot, built from limited data, of how six top managers at CP believe the gainsharing program affects CP’s performance at the time the research was conducted.

7.1.2 How Gainsharing Works to Affect Performance

Gainsharing works to affect organizational performance by providing additional forces for performance goal achievement. Gainsharing, however, does not provide a management practice or process through which performance goals are achieved. To highlight the difference between “force” and “process,” consider a gainsharing program in the context of these commonly cited barriers to performance achievement (Deming, 1986; Aguayo, 1990):

- Poor or inadequate training
- Lack of direction
- Poor planning that results in delays or deadline anxiety or both
- Inadequate job documentation and drawings
- Goals without the tools to achieve them
- Inadequate product design or process design or both
- Poor working environment
- Lack of communication
- Lack of process knowledge on the part of supervisors and managers
- Struggle to get help from engineers
- Arbitrary decisions by boss
- Unclear how contribution is valued
- Fear

These roadblocks are most likely the result of inadequate or defective systems of management, not from the absence of gainsharing. For example, a gainsharing program does not provide training or improve process design or eliminate employment security fears. A gainsharing program can, through its interaction with a multiplicity of forces that permeate organizational life, provide forces for improved management practice in areas like planning, communication, and cooperation (see, for example, Bullock and Lawler, 1984), but it is not better management in and of itself.

While gainsharing provides additional forces for performance goal achievement, it can also provide forces for setting safe performance goals. Setting safe goals is a common phenomenon in organizations, especially when rewards are linked to performance (see

Jackall, 1988; Kerr, 1975). An industrial engineer, in describing a gainsharing program at a Veterans Administration Hospital where he works, illustrates this point:

Mechanically, everything appears to work perfectly. However, the quality of the goals themselves is less than desirable. The problem as I see it is in our ability to “stay the course.” I have been very successful in generating the passion for improvement in top management. The difficulty is in sustaining that passion for a long enough period of time to achieve the results we seek. The (gainsharing) project began with management assurance of “total commitment.” However, when it came time to develop goals and objectives required to strategically move the organization, the problems set in. The fear of developing goals and objectives which were measurable and introduced the possibility of failure overwhelmed the organization. This resulted in strategies designed to ensure 100 percent probability of successful completion without regard to whether or not organizational improvements were realized.

Gainsharing must be implemented in a culture where a critical mass of managers (top managers in particular) and workers are both intrinsically motivated to perform well and are allowed to perform well (see point 1 above). Many of the conditions favoring a gainsharing program, such as open communication, and trust and cooperation (see Lawler, 1981 and White, 1979) do not appear overnight in an organization whose culture has not supported these characteristics in the past. If managers and workers do not identify with the organization’s purpose and are not motivated by that purpose, or the gainsharing bonus becomes an end in and of itself, practices like safe goal setting will occur. In addition, if the raising of performance goals translates to lower gainsharing bonuses than were earned in the past, goal changes will be resisted. Raising performance goals while lowering gainsharing bonuses is analogous to rate-cutting in piece-work plans.

7.1.3 Gainsharing Study Levels

There are two interrelated, though somewhat distinct, levels at which management programs like gainsharing should be studied.¹ One level, which was the primary focus of this research, is the operational level. Studies at the operational level address the question: How does gainsharing (or some other management program) affect organizational performance? The other level deals with the approach to these performance variables and relationships, not in the variables and relationships themselves. This level is the administrative level. Studies at the administrative level deal with gainsharing program management, with an emphasis on program implementation. Causes and correlates of gainsharing program success at the operational and administrative level are not differentiated in gainsharing studies and only became apparent as the researcher was attempting to match gainsharing study causes and correlates to those in the site-specific model. The distinction made between the operational level and administrative level has implications for gainsharing program design. More will be said on these implications in the following section.

7.2 IMPLICATIONS FOR GAINSHARING PROGRAM DESIGN

This research study, while not focused on design issues, did suggest design activities: 1) build a causal model, 2) address the operational and administrative levels, 3) set performance goals based on system capability, 4) make bonus payments significant, and 5) create line-of-sight for program participants.

¹The word “level” as used here is not meant in a hierarchical sense. Rather it is used in the same sense as plane or view or perspective.

7.2.1 Causal Model

The design of a gainsharing program should begin with a causal model (or macro-level process flow diagram) of how the organization works. Because this causal model depicts key performance variables and relationships, it provides a practical theory from which valid gainsharing performance measures (or other management programs) can be selected. The designers of a gainsharing program can also use this causal model to help determine what information should be shared to influence line-of-sight.

The perceived need for or perceived importance of a causal model probably increases as line-of-sight decreases. In a high line-of-sight environment like CP, this causal model may not be viewed as critical as it would be in a low line-of-sight environment because the cause-and-effect relationships in the former environment are more visible, more straightforward, and more understood. However, even in a high line-of-sight environment, the wrong measure or measures can be selected. Commonwealth Paper was fortunate to have selected what seems to be the right gainsharing measure: average daily production. They could have just as easily settled on their initial five performance measures (safety, housekeeping, production off the paper machine, manufacturing costs as compared to budgeted costs, net sales as compared to projected selling price). However, because they did not anticipate the dynamics of selling price, and production's relationship to profit, the production measure has gotten them into trouble at times. Therefore, regardless of the level of line-of-sight, it would be wise to have the causal model.

The process of causal model development should include the direct participation of people in the system. Because managers and workers are not trained in building causal models, this involvement will probably be limited to the review of successive model versions. The site-specific model presented in Chapter Five emerged through a grounded (i.e. data based), circular process of listening to interview tapes, reviewing field notes and

interview transcripts, referencing secondary data sources, and attempting to reach closure by visually portraying variables and relationships. Because the managers who supplied the words for the model were not consulted throughout the model building process, they were somewhat confused by the final model. Both acceptance and understanding of the causal model may have been enhanced had these managers participated in a series of reviews rather than one, final review.

7.2.2 Operational and Administrative Level

The designers of a gainsharing program must concern themselves with system structures that operate at two different levels. At the operational level, the designers of a gainsharing program must concern themselves with an eroding goal structure, a structure that creates pressures to achieve and lower performance goals. At the administrative level, the designers of a gainsharing program must concern themselves with a limits-to-growth structure. Limits to growth structures tend to be present in most organizational improvement programs and often frustrate organizational changes that seem to be gaining ground at first, then run out of steam (see Senge, 1990; also see Appendix C). Operationally, the designers must concern themselves with the mechanisms that play a role in creating forces for goal achievement, mechanisms like performance measurement, information sharing, and bonus payments. Administratively, designers must concern themselves with limits: goals (e.g. the amount of information or power top management wants to share), resources (e.g. engineering support to implement improvements or capital), or norms (e.g. employment security fears) that slow down and stifle the gainsharing effort. They must also concern themselves with conditions such as top management support and legitimization, education and training, and worker acceptance and buy-in.

7.2.3 System Capability

System capability must be considered in determining performance goals and gainsharing bonuses. Performance goals or gainsharing bonuses which are not perceived as achievable will probably not create the necessary forces for improvement. On the other hand, performance goals or gainsharing bonuses that are too easily achieved will not move the organization forward. Commonwealth Paper makes use of both statistical quality control and test periods for determining system capability, from which they establish performance goals and gainsharing bonuses.

7.2.4 The Gainsharing Bonus

To create a perceived need for the gainsharing bonus, the gainsharing bonus earned should be viewed as significant by those receiving it. Kanter (1989) has argued that any gainsharing bonus must be greater than ten percent of total pay if it is to be viewed as significant. Gainsharing bonuses at CP have averaged 16% the past six years. Coupled with competitive wages, CP employees financially depend on the gainsharing bonus. As a result, there is a perceived need for the gainsharing bonus. It should be pointed out that this perceived need cannot be created by reducing base pay by the amount of gainsharing bonuses. The gainsharing program will quickly be perceived as a “takeaway.” Under these conditions, the gainsharing bonus will still be needed, but other effects of the gainsharing bonus, like management-labor goal alignment, will be undermined. In addition, an important limit comes into play here: the size of the bonus top management believes is reasonable. The researcher participated in a gainsharing program where the top manager would look at the bonuses earned, claim they were too much, and reduce them.

The effects of this action were the same as the effect of rate cutting in piece work plans: reduced effort and lack of trust.

7.2.5 Line-of-Sight

The site-specific model and general model suggest that the perceived influence on gainsharing results (i.e. line-of-sight) is an important condition. At a minimum, a critical mass of organizational members must perceive a moderate to strong, positive correlational relationship between actions to improve performance and the gainsharing bonus earned. If this relationship is considered spurious, the gainsharing bonus will be viewed as uncontrollable or a “lottery” and the perceived need to improve performance will decrease. The complexity of the gainsharing bonus, size, and participation are the three variables that appear to influence line-of-sight. Gainsharing bonus complexity (or conversely, gainsharing bonus understanding) and participation are the variables that receive most attention in gainsharing studies (see Section 6-2). As gainsharing bonus complexity increases, understanding decreases, and the line-of-sight between efforts, results, and rewards decreases. Participation’s effects are less clear than this; the effects of size are even less understood.

Participation has received more support than size as a critical variable influencing gainsharing program success (see Hammer, 1988). In the site-specific model, participation played a diminished, and somewhat unclear role. It may be the case that there is a pro-participation bias in gainsharing studies because the early literature stressed participation’s importance for success (see Frost, Wakely, and Ruh, 1974; Lesieur, 1958); over time, participation became associated with gainsharing and its effects became assumed. Or it may be the case that because CP is such a high line-of-sight work environment, formal participative processes may not be needed to establish a connection between contribution

and results. This line-of-sight already exists. In lower-line of sight environments, formal participation may be needed only because it shapes perceptions of influence on gainsharing results. The gainsharing bonus, in combination with participation, establish line-of-sight, regardless of whether the participation had any real organization-wide impact. If managers and workers perceive themselves as having an influence on results, that perception has real consequences for these managers and workers.

The site-specific model suggests that the number of organizational levels (or layers of bureaucracy), which is a size-dependent or size-related variable, influences line-of-sight. And, I suspect that size does play a role in gainsharing program performance because most organizational phenomena are subject to scale-effects (see Hardin, 1985). However, there have been no consistent findings that demonstrate gainsharing working better in small organizations than in large organizations (see Bullock and Lawler, 1984). A possible reason why gainsharing studies have failed to find a consistent relationship between size and gainsharing program success is that size may not be a single construct. The variable size could be comprised of a number of dimensions, such as the number of employees or organizational levels or production processes. For example, CP is a relatively high line-of-sight environment because it has three levels of management, around 250 employees, a single production process with a relatively short cycle time, and a single product type (corrugating medium). An organization the same “size” as CP, in terms of employees and organizational levels, may have multiple production processes with long cycle times and multiple product types (e.g. a job shop). Simply measuring size by the number of employees or organizational levels would not reveal the key differences that may be impacting line-of-sight. However, organizational size, whether its measured by number of employees or organizational levels or production process, must be taken into consideration.

As organizational size increases, the relationship between an individual's or group's actions and performance results probably becomes more difficult to establish.

7.3 MODELING ISSUES

This section addresses five issues that researchers will probably confront who wish to repeat this research study or conduct a similar research study: 1) keeping the model simple yet complete, 2) imposing too much structure on the phenomenon studied, 3) incorporating multiple, subjective realities into the model, 4) selecting the appropriate modeling approach, and 5) incorporating qualitative concepts into the model.

7.3.1 Simplicity

When attempting to model something where existing research is little help, it becomes difficult to keep the model simple. This is especially troublesome in causal modeling, where the inclusion of an extraneous variable may multiply into the inclusion of several extraneous variables.

7.3.2 Mechanistic Structure

Because modeling organizational phenomenon tends to both force and reinforce a mechanistic view of organizations, a certain "rationality" or "order" is imposed by researchers that may or may not exist. When a researcher attempts to create a model of a particular phenomenon, like gainsharing, that is deeply embedded in the everyday ebbs and flows of organizational life, she or he must make an assumption on which the validity of results rests, yet which may not be true: individuals working in and living in the organization have considered how the phenomenon behaves. Or, if they have considered

how the phenomenon behaves, they can articulate it. Or, if they can articulate it, the words can be portrayed graphically. It is little wonder that top managers at CP thought the site-specific model “complex.” These were the same managers who referred to their gainsharing program as “the cement that holds the whole partnership together,” a “bonder,” and a “curiosity.”

7.3.3 Multiple, Subjective Realities

There are multiple, subjective realities operating in an organizational setting, and each of these realities is valid to a degree, regardless of whether they support each other. A model that marries these subjective realities may capture an objective reality, which is itself emergent and dynamic, but still misses an important point. Sociologist William Issac Thomas, provided a simple and powerful rationale for the significance of subjectivity in social life: “...if men define situations as real, they are real in their consequences.” Because of differences among individuals in terms of organizational position, responsibility, and background, different perceptions of an organizational phenomenon, like gainsharing, will be present. While multiple perspectives are required to understand and accurately depict the phenomenon of interest, the interface and integration of these perspectives into a single perspective may or may not matter when viewed from the perspective of individual actors who only experience select portions of that single perspective.

7.3.4 Modeling Approach

The modeling approach employed by a researcher will bias results toward the inclusion of certain concepts and the exclusion of other concepts. Organizations can be viewed from multiple perspectives (e.g. management-worker, line-staff, top-bottom), from

multiple metaphors (e.g. machine, organism, culture, political system), and through different methodologies (e.g. quantitative, qualitative). The perspective taken, the metaphor guiding the investigation, and the methodology used determines to a large degree what is seen (see Morgan, 1986).

7.3.5 Qualitative Concepts

Concepts that are presumed to be important, but which do not have generally accepted definitions, can be given definitions and incorporated into a causal model, *but only to a certain degree*. The creation of a single, site-specific case model and a hypothesized general case model was envisioned as a step toward the development of a simulation tool for gainsharing program design and development. Individuals and groups responsible for a gainsharing program's design and development could use this simulation tool to ask "What if?" questions and experiment with new program policies. However, the presence of qualitative concepts in the causal model makes the translation to the mathematical simulation model difficult.

Quantitative concepts like production rate, production capability, lost time, and gainsharing bonuses paid are relatively straightforward to incorporate in a mathematical simulation model. Typically, both operational definitions and data exist for them. Statistical techniques, like correlation analysis, can be applied to these concepts to validate relationships claimed in verbal descriptions.

Qualitative concepts, like the perceived need to increase production or labor-management goal alignment, present a more difficult problem. Typically, definitions and data do not exist for them. Where definitions exist, they often include other qualitative concepts. Where data do not exist, parameter values must be assumed (note that assumed parameter values in the correct system structure will still produce the characteristic,

dynamic behavior of the system whereas accurate parameter values in an incorrect structure will not [Forrester, 1975: 3]). However, to “force fit” these qualitative concepts into a quantitative framework — for example, through the use of non-parametric relationships — may alter the meaning of the concept . Where data can be collected quantitatively, the concepts themselves are often subjective and emergent. So, on the one hand, the inclusion of qualitative concepts in a causal model helps provide a gestalt view. On the other hand, many of these qualitative concepts will most likely be left out of the model when translating it to a mathematical simulation model.

7.4 DIRECTIONS FOR FUTURE RESEARCH

This section presents five recommendations for future research: 1) interviewing workers, 2) translating the causal model into a mathematical simulation model, 3) defining the constructs used in gainsharing studies, 4) modeling organizational systems in case studies, and 5), differentiating studies between the operational and administrative level.

7.4.1 Worker Interviews

Further studies investigating how gainsharing works to affect performance (including follow-up studies at CP) should interview workers and provide for more participant involvement in model development. Operators and mechanics, clerical and administrative personnel should be interviewed to provide a perspective that is missing here. In hindsight, the research would have benefitted from this perspective because it would have provided additional data. For example, managers were reluctant to admit the influence of the gainsharing program on their own behavior. Operators and mechanics, clerical and administrative personnel may be more open in this regard.

In addition, there should be more involvement on the part of managers and workers throughout the building of the causal model (see Section 7.2, Point 1). However, when conducting research in this situation, a researcher must be extremely sensitive to the time spent on the project by organizational participants and the skill-level. On the one hand, enough time must be taken to get the desired research results. On the other hand, the researcher could easily be perceived as a nuisance and project participation a burden, by taking too much time. Throughout this research, I had to work within the time constraints of the participants. Often, this meant having less time with each participant than I initially hoped.

7.4.2 Mathematical Simulation Model

Either the site-specific model developed in this study, or the site-specific models developed in other studies should be translated to the next step: a mathematical simulation model. The results of this effort would more than likely provide additional insight to how gainsharing works to affect performance.

7.4.3 Definitions

The constructs used in gainsharing studies, like information sharing, participation, and size, should be given definitions. Without clearly defined constructs, it is difficult to compare results across studies.

7.4.4 Case Study Causal Models

Case studies of gainsharing should include causal models of the organizational system studied. That is, organizational performance can no longer be treated as a “black box.” The original research question which asked, How does a gainsharing program affect

organizational performance?, would have been better stated as two questions: 1) What organizational performance variables and relationships does a gainsharing program affect? and 2) How are they affected? In addition, it seems that one first needs to understand the variables and relationships which affect performance before one can understand how gainsharing (or any other management program) works to affect performance. This makes sense if one considers the intended purpose of management policies and programs: to improve organizational performance. This broader performance focus has been conspicuously absent from prior gainsharing research (and organizational performance research in general).

7.4.5 Study Focus

Gainsharing studies need to differentiate between two levels: operational and administrative. Studies at the operational level address the question: How does gainsharing affect organizational performance? The administrative level concerns the approach to these performance variables and relationships, not the variables and relationships themselves. Studies at the administrative level address gainsharing program management, with an emphasis on program implementation.

7.5 SUMMARY

Frederick W. Taylor, the Father of Scientific Management, and W. Edwards Deming, a founder of Total Quality Management, cite defective systems of management as the main source of organizational quality and productivity problems (Deming, 1986; Taylor, 1911/1967). A common management practice in Taylor's day was management by "initiative and incentive," in which managers would offer rewards to workers and then hope for the workers' best efforts; workers, however, were not provided the proper methods and tools for goal accomplishment and were often treated unfairly when those goals were achieved (Taylor, 1911/1967). The result of this treatment was "systematic soldiering"; workers would simply restrict their production output. Under the management practice of initiative and incentive, managers labeled performance problems like systematic soldiering as motivational problems. Seventy-five years after Taylor, Deming (1986) has observed this same management practice, calling it madness.

This research study suggests that gainsharing provides additional forces for performance goal achievement, not a management practice or process through which performance goals are achieved. Gainsharing implemented in an organization where people are not provided the proper methods and tools for goal achievement and not treated fairly is just another variation of management by initiative and incentive. The gainsharing application is driven by management's belief that the organization's performance problems are motivational problems; all that is needed is more motivation.

Gainsharing helps create conditions that make work motivation a "non-problem" when it is implemented in a climate characterized by: 1) fairness (see Sashkin and Williams, 1990), 2) implicit employment security guarantees and compressed management-labor compensation differentials (see Levine and Tyson, 1990; Sashkin and Kiser, 1991), 3)

pervasive information sharing (see Lawler, 1986), 4) pride-in-work (see Barnard, 1938; Deming, 1986), and 5) methods and process engineering (see Deming, 1986; Taylor, 1911/1967). Because gainsharing is a reward program, I expected managers at CP to emphasize its motivational characteristics. As it turned out, motivation was rarely mentioned. In a company-wide listing of some 50 performance improvement roadblocks in 1989, lack of motivation to improve, a commonly cited roadblock in most organizations (see Sink and Tuttle, 1989) was not mentioned. A historical look at the evolution of modern work organizations shows that prior to the Industrial Revolution, motivation was considered a matter of personal values, not a problem to be worked on by management (see Lux, 1990). In fact, the distinctions between management and labor were less clear in the small craft organizations which the Industrial Revolution replaced than these distinctions are today (see Lawrence, 1985). By providing both an ownership stake in the business through gainsharing, and by providing a sense of ownership through their management practices, CP has blurred the lines between management and labor. The motivation issue has become one of personal values. And because they take care in selection and placement, CP helps ensure that every prospective employee's values are consistent with the company's guiding principles.

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**APPENDIX A:
SUMMARY TABLES OF COMMON
GAINSHARING PROGRAMS AND
CAUSES AND CORRELATES OF SUCCESS**

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Table A-1. Comparison of Gainsharing Programs

PLAN DIMENSION	SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES
MEASUREMENT	Based on relationship of labor costs to sales value of production: $\frac{\text{Labor Costs}}{\text{Sales Value of Production}}$ where Sales Value of Production equals sales less returns and allowances \pm changes in inventory.	Two or more single ratios weighted according to product labor content. Each ratio would include direct labor and an allocation of various overhead expenses. $\frac{\text{Labor Costs by Product}}{\text{Sales Value of Production}}$	Typically captures 75-90 percent of total costs. If total costs are captured, would be appropriately referred to as profit gainsharing. Can be designed as split ratio if costs vary along product lines. $\frac{\text{Labor, materials, and overhead}}{\text{Sales Value of Production}}$	Similar to Improshare. Compares actual with allowed labor for each product. Indirect labor and other personnel costs are included as percent of allowed direct labor. $\frac{\text{Actual Labor}}{\text{Production Standard}}$	Uses a ratio of labor costs to value added for the productivity base: $\frac{\text{Labor Costs}}{\text{Value Added}}$ where Value Added equals sales value of production less materials, supplies, and services.	Measures labor hours, direct and indirect used to produce one unit of product. Uses a Base Productivity Factor to adjust standards for past actual output: $\frac{\text{Actual Hours}}{\text{Total Standard Hours Produced}}$ Ceiling and buy-back principles are employed.	A "take-off" of Improshare. Measures include labor and/or materials, inventory, and energy. Ceiling and buy-back principles are employed.	Uses a multi-criteria approach to measure performance. Improvement targets are established and tied to a gainsharing fund.
IMPROVEMENT FOCUS	Objective is to improve labor productivity: • Lower scrap and rework • Fewer customer rejects and returns • Increase output • Better methods • New equipment	Same as single ratio.	Objective is to improve multi-factor productivity: • Lower scrap and rework • Fewer customer rejects and returns • Increase output • Better methods • Inventory reduction • Material savings • Energy savings • New equipment	Objective is to improve labor productivity: • Lower scrap and rework • Increase output • Better methods • New equipment	Objective is to decrease labor to increase the value of what is produced. Some Rucker suggestions for improving productivity are: • Material and supply savings • Lower scrap and rework • Fewer customer rejects and returns • Increased prices • Higher output • Better methods • New equipment	Objective is to improve labor productivity: • Lower scrap and rework • Increase output • Better methods • New equipment	Objective is to improve labor and material productivity. Focus is on labor costs, material costs, and inventory reduction.	Objective is to improve performance in the areas of effectiveness, efficiency, quality, and innovation. Productivity and profitability/budgetability may be included.

Table A-1 Continued. Comparison of Gainsharing Programs

PLAN DIMENSION	SINGLE OR SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES
EXAMPLE CALCULATIONS	Sales Value of Production	SVP Product A	SVP Allowed-Input costs (80%)	Units Produced	SVP	Base Productivity Factor	Calculation dependent on measure and on whether Plan A or B is used. In Plan A, productivity sharing is permitted up to a predefined ceiling and requires implementation of a buy-back once the participating group has demonstrated its ability to perform above the ceiling. Productivity sharing in Plan B is determined by a predefined Target Bonus whose value reflects the planned long term bonus earning for the plan. Plan B is based on a periodic evaluation of performance to implement whatever buy-backs are possible.	Site specific. Measures are tied to gainsharing fund.
	Allowed Labor Costs (21%)	SVP Product B	Actual Labor Costs	Allowed Direct Labor Hours	Less Materials, Supplies	Units Produced		
	Actual Labor Costs	Allowed Labor Costs A (7%)	Actual Material Costs	Allowed Indirect Labor Hours	Value Added	Employee Standard Hours		
	Bonus Pool	Allowed Labor Costs B (14%)	Actual Energy Costs	Allowed Overhead Labor Hours	Actual Labor Costs	Total Impros-share Earned Hours		
	Reserve Pool (25%)	Actual Labor Costs	Bonus Pool	Actual Hours	Standard Value Added (actual labor x Rucker Standard)	24,150		
	Bonus Balance	Bonus Pool	Remaining calculations same as single ratio. Sharing ratio may differ	Bonus Pool	Bonus Pool	21,000		
	Company Share (25%)	Remaining calculations same as single ratio		Bonus Pool	Bonus Pool	Actual Hours		
	Employee Share (75%)			Bonus Pool	Reserve Pool (33%)	Bonus Hours		
						3,150		
						25,000		
					3,150			
					1,575			
					1,575			

Table A-1 Continued. Comparison of Gainsharing Programs

PLAN DIMENSION	SINGLE OR SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES
LINE OF SIGHT	<ul style="list-style-type: none"> • Easy to understand • Related to employee costs • Does not separate productivity from price recovery • Does not capture impact of other factors 	Same as single ratio	<ul style="list-style-type: none"> • More difficult to understand • Useful for identifying cost drivers • Does not separate productivity from price recovery 	<ul style="list-style-type: none"> • Helps isolate problem areas in labor • Does not capture impact of other input factors • Employees relate to measure 	<ul style="list-style-type: none"> • Difficult to communicate value-added concept • Not very helpful in isolating problem areas • Does not separate productivity from price recovery 	<ul style="list-style-type: none"> • Very good. Most workers understand relationship between hours worked and units produced • Does not capture impact of other input factors 	<ul style="list-style-type: none"> • Very good when used at department level • Does not separate productivity from price recovery • Does not capture impact of many input factors 	<ul style="list-style-type: none"> • Site specific. Often, the unit of measurement is different than the unit of analysis for gainsharing
BEST FIT APPLICATIONS	<ul style="list-style-type: none"> • Manufacturing organizations • Labor is a major cost driver and labor productivity is a critical dimension of performance • Sales prices and labor costs change at similar rates • Stable product mix with few design changes • No major capital investments planned 	<ul style="list-style-type: none"> • Manufacturing organizations • Labor is a major cost driver and labor productivity is a critical dimension of performance • Sales prices and labor costs change at similar rates • No major shifts in prices along product lines • Can accurately capture payroll costs by product • No major capital investments planned 	<ul style="list-style-type: none"> • Manufacturing or service organizations • Educated workforce regards to financial data • No major shifts among quantities of inputs and outputs. • No major shifts in costs of inputs and prices of outputs. • Labor, material, and energy productivity are critical dimensions of performance 	<ul style="list-style-type: none"> • Manufacturing organizations • Accurate, up-to-date time standards. • Ratio of direct to indirect costs is relatively stable. • Direct and indirect costs allocated properly. • Direct labor is a major cost driver. • Labor productivity is a critical dimension of performance 	<ul style="list-style-type: none"> • Labor dominated organizations • Educated workforce regards to financial data • Labor and materials are major cost drivers and labor productivity is a critical dimension of performance 	<ul style="list-style-type: none"> • Manufacturing and labor dominated service organizations • Ratio of direct to indirect labor is relatively stable • Labor is a major cost driver • Labor productivity is a critical dimension of performance 	<ul style="list-style-type: none"> • Labor dominated manufacturing organizations • Labor and materials are a major cost driver and labor productivity is a critical dimension of performance 	<ul style="list-style-type: none"> • Manufacturing and service organizations • Productivity may or may not be a critical dimension of performance and/or dominated by materials and capital

Table A-1 Continued. Comparison of Gainsharing Programs

PLAN DIMENSION	SIMPLE OR SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES
UNIT OF ANALYSIS	Plant or Firm							
PARTICIPANTS	All plant and office personnel.	Top management is typically excluded.	Typically excluded.	Includes at least all direct and indirect factory personnel. Other employees can participate directly in the bonus or can be paid a matching bonus from the company's share. Top management is excluded.	Plant, Function, or Department	Designed for non-exempt operating personnel. Recommended that other employees be paid a matching bonus from the company's share. Top management is excluded.	When used at the department level, all employees plus supervisor. When used at the plant level, excludes management, personnel, marketing, R&D, finance.	Typically applied at plant and firm level. Site specific.
MEASUREMENT SCOPE/ FREQUENCY OF PAYOUT	Typically Monthly. Quarterly is not, however, uncommon.							
SHARING RATIO (company participants)	Gain shared 25:75. 25 percent of participants share typically set aside in reserve fund.	Gain shared 25:75. 25 percent of participants share typically set aside in reserve fund.	Gain shared depending on inputs included. Typically 25:75 on labor, 50:50 on other inputs. 25 percent of participants share typically set aside as reserve fund.	Usually shared 50:50. Reserve funds sometimes used.	The ratio of labor costs to value added determines what is available to pay labor, and money not used to pay wages and benefits is the bonus. 33 percent set aside as reserve. Remaining amount to participants.	Hours saved shared 50:50. Base is adjusted 80 percent for changes in machinery and equipment. Reserve fund not used.	Monthly or quarterly.	Typically paid quarterly, semi-annually, or annually. Site specific.

Table A-1 Continued. Comparison of Gainsharing Programs

PLAN DIMENSION	SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES	
DATA REQUIREMENTS	3-5 years historical data. sales value of production and labor costs	3-5 years historical data. sales value of production and labor costs by product	3-5 years historical data. sales value of production and labor, material, and energy costs	Engineered labor standards, estimates, or historical data to formulate direct labor hours associated with output	3-8 years of historical data: sales value of finished goods; costs of raw materials and supplies; payroll for all employees	Engineered labor standards, estimates, or historical data to formulate direct labor hours associated with each unit of output	Performance level averaged over a stable period in the past (typically six months to one year)	Historical data, standards, estimates, and/or goals/targets	
ADVANTAGES	<ul style="list-style-type: none"> • Easy to understand • Related to controllable costs • Easy to administer and maintain 	<ul style="list-style-type: none"> • Easy to understand • Related to controllable costs • Fairly easy to administer and maintain 	<ul style="list-style-type: none"> • Meets costs included • Shares overall success • Adaptable to changes in product mix 	<ul style="list-style-type: none"> • Considers some product mix problems • Prices do not affect or can be easily adjusted • Easy to install • Related to controllable inputs 	<ul style="list-style-type: none"> • Cyclical variation of outside purchases and nonlabor costs are kept out of the formula • Deals with product mix and price changes by offsetting increased supply with selling prices 	<ul style="list-style-type: none"> • Considers some product mix problems • Prices do not affect • Easy to install • Related to controllable inputs • Easy to understand 	<ul style="list-style-type: none"> • Measures performance used along several dimensions • Considers line of sight when developing measures 	<ul style="list-style-type: none"> • Many inputs excluded • Does not necessarily use productivity measures • Ceiling and buy back is complex and difficult to communicate 	<ul style="list-style-type: none"> • Unit of analysis for measures and gainsharing are often different • Unit of analysis not kept constant across measures • Translating measures into dollar amounts
POTENTIAL PROBLEMS	<ul style="list-style-type: none"> • Limited inputs included • Product mix may influence • Changes in input and output prices influence more • Inventory may influence more 	<ul style="list-style-type: none"> • Limited inputs included • Changes in input and output prices influence more • Inventory may influence more 	<ul style="list-style-type: none"> • Changing input and output prices influence • Difficult to ascertain cause-effect relationships • Difficult to communicate 	<ul style="list-style-type: none"> • Limited inputs included • Standards may have to be frozen • Disagreement over standard setting • Difficulty of adding inputs such as overtimes and new products 	<ul style="list-style-type: none"> • Some inputs excluded • Defining an outside purchase • Determining how to handle capital • Difficult to administer 	<ul style="list-style-type: none"> • Tightening standards across the board. Tight standards become tighter • Loose standards may remain loose • Changes in ratio of direct to indirect 	<ul style="list-style-type: none"> • Tightening standards across the board. Tight standards become tighter • Loose standards may remain loose • Changes in ratio of direct to indirect 	<ul style="list-style-type: none"> • Many inputs excluded • Does not necessarily use productivity measures • Ceiling and buy back is complex and difficult to communicate 	<ul style="list-style-type: none"> • Unit of analysis for measures and gainsharing are often different • Unit of analysis not kept constant across measures • Translating measures into dollar amounts

Table A-1 Continued. Comparison of Gainsharing Programs

PLAN DIMENSION	SIMPLE OR SINGLE RATIO SCANLON	SPLIT RATIO SCANLON	MULTI-COST SCANLON	ALLOWED LABOR SCANLON	RUCKER	IMPROSHARE	SHRED-COST	FAMILY OF MEASURES
MANAGEMENT PHILOSOPHY	Closely linked to McGregor's Theory Y. People prefer to express themselves in all situations, including work situations, and when they do, they can be constructive and supportive of the groups to which they belong.				The firm's greatest untapped source for productivity gains is its own workforce.	The goal of management and labor are congruent and can be met by encouraging the worker's will to work.	An organization's employees are among its most important resources and developing these should be a major objective	Site specific
THEORY AND/OR ASSUMPTIONS	The basic philosophy is best served when all members of the organization participate as fully as they can in the activities of the organization and when they are equitably rewarded for their participation.				If management wants employees to find new ways to eliminate waste, reduce costs, and improve methods, they must allow people to share in the gains resulting from these improvements.	The group gainsharing bonus is the principal method of encouragement. Programs that offer job satisfaction as the prime reward will not have wide spread support and will not tap into the potential for improvement.	Gainsharing provides the logical reward system for use with participative approaches to improve productivity.	A family of measures approach helps activate interest, gets buy-in, and motivates improvement. Basing rewards on these same measures further motivates constant improvement.
MANAGEMENT STYLE AND PROCESS	Participative management system consisting of department suggestion				Management is encouraged to communicate with, listen to, and solicit ideas from employees. Some companies have added single plant-wide or multi-level committees to process suggestions.	Doesn't encourage the adoption of new management practices. Suggests that as workers realize bonuses come from better methods, the ideas will flow. Can, however, be integrated with participative practices.	Steering council and three types of formal teams used: coordinating committees, action teams to investigate problems, and worker involvement teams to provide a forum for solving problems.	Site specific

Table A-2. Causes and Correlates of Gainsharing Program Success (Studies conducted before 1979 were reviewed by White, 1979)

Study	Type	Author Bias	Correlations/Causes of Success Identified (and corresponding hypotheses in text)		Comments
			Case	Studies	
Chamberlain, 1946	Case study of Adamson Co., a small manufacturer of welded steel tanks	Strong (sensational) pro SP bias— <i>Life</i> magazine	Situation where: profits are determined primarily by productive efficiency, single union—no jurisdictional squabbles; prompt feedback given on performance	This is the company/article that triggered the Scanlon Plan interest and got it all started	
Davenport, 1950	Case study of Lapointe Machine Tool—a 350 employee manufacturer of broaches	Pro SP but realistic	Intelligent union leadership; key top executive "who is able to stand the gaff" (H.7, 14) ^b	This is the best known article about the best known SP application—but see Northrup and Young (1968)	
Daignault, 1952	Another case study of Lapointe Machine Tool	Pro SP bias	Management making and communicating a sincere commitment to employee participation (H.6,13)	Little new information or insights	
Dowd, 1955	Another case study of Lapointe Machine Tool	Pro SP bias	None	Just another description of Lapointe	
Lesieur, 1951	Another case study of Lapointe	Strong pro SP bias	"good faith, mutual respect and confidence in hearts of all the participants"	Nothing new, nothing much	
Lesieur, 1959	Discussion of SP drawing heavily on Lapointe experience	Strong pro SP bias	None	Apple pie and motherhood—"the satisfaction gained from a job well done will exceed the value of whatever employee bonuses and company profits the plan might generate"	
Northrup & Young, 1968	Summary of problems at Lapointe resulting from SP	Reasonably objective articulation of potential SP problems	Unwillingness of management to invest in research, capital, and supervision in order to maintain immediate bonus payments	Shows how an SP can get in trouble—in this case because management failed to stand the gaff and succumbed to pressure to maintain bonus payments rather than make needed capital investment	
Tait, 1952	Description of implementation and early operation of the SP at Stromberg-Carlson Company	Objective (descriptive, not evaluative)	None	Interesting discussion of employee reasonableness when confronted with business realities (company losing money)	
Gilson & Lefcowitz, 1957	Case study of an unsuccessful SP in a small (anon) family owned ceramics plant	Reasonably objective	Management must have sincere commitment to participation (H.6,7,13,14); underlying company problems (grievances) must be dealt with or they interfere with the SP activities; work force must have at least a minimal level of job/career involvement	Although both union and management concurred in the decision to abandon the SP, some achievement occurred during the period plan in effect: labor costs dropped, bonus was paid, and production process was rationalized	
Martucci, 1957	Case study of SP at Pfaulder Co., five years after plan was implemented	Pro SP bias but more descriptive than evaluative	None	See Lesieur and Puckett (1969) below	
Steen, Fye, Orth, & Strong, 1961	Description of SP at Revco—a manufacturer of refrigeration units with 495 employees	Mainly descriptive but some pro SP bias	None	Unquestionably their SP was successful at the time the article was written; however, the company no longer operates with an SP and was one of the abandoned SPs studied by Wallace (1971)	
Jehring, 1967	Study of a 200 employee manufacturer (anon) of household fixtures that implemented an SP and then switched to profit sharing	Reasonably objective	SP (bonus formula) is too rigid in situations where changing product mix results in changes in labor content	Although presented as a switch from an unsuccessful SP to a successful profit sharing program, the situation could be viewed as merely identifying a more appropriate bonus formula (insufficient information to tell)	
Production, 1969	Case study of SP experience at Michigan Wheel—a 230 employee manufacturer of marine propellers	Strong pro SP bias	None	Unlike most articles written shortly after plan implementation, this one was done after 23 years' experience and the plan is still active today	

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success (Studies conducted before 1979 were reviewed by White, 1979)

Study	Type	Author Bias	Correlations/Causes of Success Identified (and corresponding hypotheses in text)		Comments
			Case Studies cont.	Case Studies cont.	
Lesieur & Puckett, 1969	Brief case studies of SPs at Attwood Vacuum Machine, Pfaulder, and Parker Pen	Strong pro SP bias	None		Pfaulder case indicates sustained SP success twelve years after the Martucci (1957) article was published
Gray, 1971	Thorough case study of unsuccessful SP at the large Linwood plant of Pressed Steel Co.—a 6,000 employee producer of car bodies for British auto industry	Objective	SP failure was <i>not</i> caused by management authoritarianism, nor by an unusual work force—basic industrial conflict can overwhelm cooperative interests and prevent SP success		Interesting, thorough, and objective case study written from an economist's rather than a behavioral scientist's viewpoint
Iman, 1972	Thorough case study of entire OD efforts (SP plus others) of a well known (but anon) 400 employee manufacturer of glass components for industrial consumers	Attempts to be completely objective but there may be subtle biases as the author was involved in the company as a change agent	There is a wealth of information on correlates of SP success, but it is difficult to summarize and much of it is not SP specific		This study, done as a dissertation, is one of the few studies that objectively combines rigorous data analysis with a willingness to use and interpret qualitative data—well worth reading
NCPO/WL, 1976	Brief case study of SPs at Parker Pen and Dana Corporation	Objective—descriptive only	None		Nothing new
<i>Books</i>					
Lesieur (Ed.), 1958	Collection of articles on the SP	Clear pro SP bias	(specific articles are included elsewhere in this review)		Until recently the only single source of extensive SP information
Frost, Wakeley, & Ruh, 1974	Summarizes the research, theory, & practice of SP activity centered around Michigan State University	Pro SP bias but good discussion of limitations	Too much to summarize		First actual book on the SP—based on over 20 years of actual SP experience
Moore & Ross, 1978	A "practical guide" to SP implementation and evaluation, including checklists, questionnaires, and sample forms	Pro SP bias but appropriate emphasis on difficulties	Too much to summarize		Although the authors mention the need to design each plan individually, their cookbook approach does not reinforce this idea. Excellent discussion on bonus formulae
<i>Empirical Studies</i>					
Wallace, 1971 (Ruh, Wallace, & Frost, 1973)	Comparison of managerial attitudes toward participative management policies in 10 continued and 8 abandoned SP companies	Objective (dissertation)	Confidence of managers in employees' ability and willingness to participate may be key to SP success (H.6,13)		One of the few empirical studies that explicitly looked at SP success as the dependent variable
Goodman, Wakeley, & Ruh, 1972	A survey of 2,636 employees from 21 plant sites on how they perceive various aspects of the SP	Objective	None explicit		Provides data showing that although all groups tended to show favorable attitudes toward the plan, attitudes are considerably more favorable for managers than for foremen, and for foremen than for rank and file
Burnett, 1973	A cross lagged panel analysis of relationship between the perceived link between employee suggestions and bonus payments and subsequent employee influence (plus more)	Objective (dissertation)	Suggests that the availability of accurate and timely information would increase employee participation and SP success		Thorough study but only deals with one narrow aspect of the SP
White, 1974	(some of it summarized in this article)				
NCPO/WL, 1975 (Moore & Goodman, 1973)	Three year longitudinal study (including pre-SP measures) of the SP at Chemical Coatings Div. of De Soto, Inc.	Objective	SP success dependent upon: a simple well communicated bonus formula, development of mechanisms to deal with nonproductive suggestions (gripes) and encourage good suggestions, adequacy dealing with the potential role ambiguity of foremen and indirect workers, emphasis on the participative process rather than the structure (H.6.13)		Both of these articles contain a good review of the SP literature and a discussion of SP that goes well beyond the specifics of their research study

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success (Studies conducted before 1979 were reviewed by White, 1979)

Study	Type	Author Bias		Comments
		Empirical	Theoretical Articles	
Greenwood, 1977	Empirical contrast (employee survey) of a successful and an unsuccessful SP company on the Frost et al. (1974) concepts of identity, participation, equity, and managerial competence	Objective (dissertation)	None specific	Study may provide foundation for developing instrumentation for diagnosing SP success and/or SP readiness
Strauss & Sayles, 1957	Review of SP with emphasis on potential difficulties	Objective	Review of SP success is dependent upon: balanced contribution from all segments of the plant; rank and file support for union leadership; good communication between staff, top and middle management; minimizing intergroup rivalry (especially in large organizations); involvement of foremen and rank and file	Strong emphasis on union and union issues (prevalent in much of the early SP literature); generally worth reading
Shultz, 1958	Discussion of the "environmental diversity" of the 19 companies at the 1957 MIT SP Conference	Pro SP bias	SP is not limited to companies of certain size (H.4.12); economic performance, relative importance of labor cost, job skill, work force characteristics, nonunion status; success is dependent upon realistic positive expectations and competent management (H.6.13)	The data and issues presented are interesting; however, all one knows is that the SP can be applied in diverse situations, not that it is necessarily successful
Puckett, 1958	Comparison of the productivity of ten companies in the two years following SP implementation with "base period"	Objective	Productivity gains unrelated to prior financial conditions, size (H.4.12), union status, relative labor costs, type of production process, type of product	Provides strong support for the SP; only issue is the nondiscussion on sample selection
Hellgott, 1962	A second source review of SP applications with emphasis on the bonus formulae and wage incentive aspects	Reasonably objective (but sometimes naive)	Scanlon Plan success is dependent upon: "assurance that a regular bonus can be paid continually"; "basic need such as financial difficulty, enthusiastic union and management support (H.6.7;1.14); complete cooperation, specific efforts to educate supervisors, segregation of SP and collective bargaining efforts, small size (H.4.12)	One of the few general discussions of the plan—unfortunately the author confuses ingredients necessary for success with actual indices of SP success
Lesieur & Puckett, 1968	General review of SP literature and activities since the Lesieur (1958) book was published	Strong pro SP bias	The SP can be applied in almost all situations—emphasis on application to large corporations (H.4.12), but little supporting evidence	The authors clearly confuse SP and SP success; wherever an SP is described as unsuccessful they contend that it really isn't an SP; they attempt to refute Northrup and Young's (1968) article on the deleterious effects of the SP at Lapointe
Doyle, 1970	Discussion of the SP and implementation of the plan based on his experience as manager of OD at Donnelly Mirrors, Inc.	Strong pro SP bias	Must not underestimate the process of changing the attitudes and habits of managers who are used to traditional management	Discusses integration of SP with other OD efforts (Managerial Grid, Lickert's ICLIS research)
Ross & Jones, 1972	Discussion of SP with emphasis on bonus formulae and the critical role of the accountant	Objective	Essential to articulate clearly the bonus formula and reasons for fluctuations	Points out the trade-offs between an accurate but complicated bonus formula and a simpler formula which may not be as fair but is better understood
Goodman, 1973	Calls for better theoretical formulations and proposes one based on an expectancy model	Objective (theoretical)	None	Articulates the lack of, and need for, better theoretical models
Thierry, 1973	Outline of a field experiment approach with heavy emphasis on SP implementation (in the Netherlands)	Objective	Emphasis on preparing an organization prior to SP implementation—need for training and other activities (survey with feedback) to prepare for and hence insure success	Follow through on the planned field experiment not available at time paper was written—the major planned study was curtailed because of intense strikes occurring in many of the trades involved

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success (Studies conducted before 1979 were reviewed by White, 1979)

Study	Type	Author Bias	Review/Integrative/	Correlations/Causes of Success Identified (and corresponding hypotheses in text)	Comments
Geare, 1976	Discussion of SP with emphasis on bonus formulae	Objective	Theoretical Articles cont.	SP success requires "intelligent, enlightened, and energetic top management and trade union officials"	Emphasizes the importance of the financial incentives and cautions that money, not participation, is the principal motivation for many employees
Frost, 1978	Discussion of "the diagnosis, assessment, and evaluation which are essential precursors to the success of the SP process"	Pro SP but realistic		Need to carefully delineate and articulate the organization's "mandate"	Interesting discussion of the "irreducible need for competence" and problem ownership although it appears equally applicable to non-SP situations
<i>SP Discussion in OB Literature</i>					
Whyte, 1955	One chapter of book devoted to SP, with heavy emphasis on Lapointe experience	Objective		Management must: not be preoccupied with protecting its prerogatives, be willing to respond to union initiative, be willing to change, take care to deal with potentially awkward role of foreman	Somewhat dated but interesting reading
McGregor, 1960	Chapter of classic text devoted to SP	Strong pro SP		None (SP good for everybody)	SP viewed as example of "Theory Y" in practice
Katz & Kahn, 1966	Several pages of their classic OB text devoted to discussion of SP	Objective		SP success may be limited by company size (H.4,12), company's previous financial success, unavailability of a charismatic figure to stimulate support (H.7,14), and increased technology	One of the few places where SP has been integrated into mainstream OB literature

^aThis list is by no means exhaustive. Those studies/articles that are (1) very redundant with those reviewed (e.g., more case studies of Lapointe) or (2) not readily available (unpublished reports and M.A. theses) are omitted. References for these additional studies are available from the author.

^bH notations in parentheses refer to hypotheses used in the present study.

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success
(Studies conducted before 1979 were reviewed by White, 1979)

Study	Type	Author Bias	Correlations/Causes of Success and Outcomes Identified	Comments
	<i>Case Studies</i>			
Driscoll, 1979	A study of seven cases to determine the usefulness of the Scanlon Plan (SP) as a system of union-management cooperation	Reasonably objective	Clear and tangible payoffs to both workers and management; conservative political structure; specialized working group to solve production problems; acceptance by management of collective bargaining; optional modes of individual contribution; support of top management and union leaders; separate commitment from union, management, and workers; formal structure for cooperation; follow-up efforts; consultant with organizational development skills and collective bargaining expertise	Fairly good discussion of gainsharing in the context of labor-management relations
Bullock and Bullock, 1982	One successful and one unsuccessful case study are reviewed	Reasonably objective but some pro gainsharing bias	Involvement structure utilizing a group-based suggestion system; financial formula to provide simple accurate indicators of overall effectiveness; weekly and monthly feedback to employees on plant performance; rapid processing time for suggestions (capacity of engineering groups responsible for evaluating suggestions); time spent in meetings; trust in top management; satisfaction with and understanding of financial formula. Outcome measures (in successful case): improved operation and effectiveness of work groups, improvements in openness, trust, cohesiveness, perception of fairness, information flow, work planning and goal setting, suggestions; improved financial performance (labor productivity, quality, labor costs)	Results reported covered the first year of implementation and evaluation; good comparison of successful and unsuccessful case along a number of performance dimensions
Ramquist, 1982	Description of the Scanlon Plan (SP) at Herman Miller	Mainly descriptive but may be subtle SP bias (author was Director of SP at Herman Miller, member of Board of Directors, Scanlon Plan Associates)	Expanded participation structure (e.g. staff participation); expanded bonus formula that more accurately reflects performance; a communication process and training and education so employees understand their jobs and the business of the organization; production capacity to meet increased demand; manager's role: management's willingness to share information, willingness to relinquish certain prerogatives, and commitment and willingness to involve employees meaningfully in the management process; employee understanding. Outcome measures: better customer service, monthly bonuses, reduced product lead time, customer shipping mistakes minimized, reduced inventory investments, better control over expenses, more rapid accounts receivable collections	A fairly good case study description of the evolution of a well-known gainsharing program
Garfinkel, 1983	Gainsharing at Hart-Cooley with mention of programs at Motorola and the Hamilton, Ontario Firestone Plant	Journalistic, descriptive account	None identified	Not much; some discussion on the difficulty associated with the transition from a standard hour plan to gainsharing
Hauck, 1983	A collection of gainsharing case studies	Pro gainsharing bias	Too much to summarize	Mostly short, descriptive case studies written by the manager(s)/practitioners involved
Wojahn, 1983	Case study of gainsharing at Pontiac Foundry Inc.	Descriptive, journalistic account	None identified	Just another gainsharing program description
Hatcher and Ross, 1985	Case study of gainsharing in manufacturing company	Pro gainsharing bias	None identified	Was uneasy classifying this study as a case study; anecdotal data used from other companies
Rauglas, 1985	Two case histories of Improshare plans	Reasonably objective	Participative management style	Claims that gainsharing cannot resolve the causes of employee relations problems

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success

Ross, Ross, and Hatcher, 1986	A mixed bag; anecdotal evidence from two case studies - Peabody Gallion and Peabody Barnes - and partial results of survey of 145 managers in eight U.S. production firms with gainsharing	Pro gainsharing bias but reasonable articulation of some important issues	Financial disclosure; union involvement; management's sincere commitment	Pretty good description of some of the important relationships in a gainsharing program
Hatcher, Ross, and Ross, 1987	Case study of gainsharing at Dana Spicer Heavy Axle Division	Pro gainsharing bias	Open network of communication (willingness to share financial information, reasons for formula adjustments); accountability for quality; participative culture; rapid feedback on suggestions; outcome measures; product quality, job security	Mostly anecdotal review of gainsharing program put in place within one year of start-up of new facility
Hack and Ross, 1987	Case study of productivity gainsharing at Volvo's Kalmar plant in Sweden	Suspect pro gainsharing bias	None identified	Mostly descriptive; survey questions are interesting
Jewell and Jewell, 1987	Case study of a pilot gainsharing program implemented in an average performing unit of a restaurant chain as part of a comprehensive change program	Reasonably objective but may be subtle bias (not clear on authors' involvement in project)	Mechanism for involving employees in the business, performance measures closely tied to important performance areas, communication of measures on an ongoing basis in an easily understood format; quality of management and culture; management beliefs and values; degree of fit with other dimensions of the organization in the change process; willingness of management to allocate sufficient time, energy, and resources for systematic and consistent design and implementation. Outcome measures: increased number of customers per week, average dollar sales per customer, profit (cost control), and profit after corporate overhead allocation; decreased labor cost as percent of sales and employee turnover	One of the few case studies in the service industry, and one of the few case studies that uses industry performance data as comparative benchmark and a longitudinal design (three years)
Markham and Scott, 1988	Anecdotal account on the role of gainsharing coordinator	Suspect some pro gainsharing bias	Skilled gainsharing coordinator	Provides job description for gainsharing coordinator
Woods, 1989	Description of gainsharing at the Naval Aviation Depot, Cherry Point	Objective (descriptive, not evaluative)	None identified	Good description of a gainsharing program in the public sector
Fein, 1981	Describes the IMPROSHARE (Improving Productivity Through Sharing) gainsharing program	Attempts to be objective but author's bias as the designer and developer of IMPRO-SHARE is apparent	None identified; gainsharing is a way to gain workers support for improvement by rewarding them for improved performance and eliminating practices that penalize them as productivity rises.	A different perspective on gainsharing; views the financial sharing component of gainsharing as what makes gainsharing work; participation in problem-solving and decision making not highlighted; introduces the concept of a ceiling on sharing and buy-backs above ceiling
O'Dell, 1981	A description and analysis of gainsharing and how it can involve and reward employees to increase productivity	Reasonably objective but suspect pro gainsharing bias	Top management commitment and support; support by middle management and supervisors, properly designed formula, adequate planning and employee education, labor relations, job security, the idea handling system; (failure) reluctance to share information, management style, poor formula (unrewarding, too rewarding, perceived as unfair, not understood), poor processing of suggestions, limited market, attempts to limit bonus size (management's perception of equity)	Good primer for managers and teams gathering information on gainsharing programs

Books

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success

Doyle, 1983	A practical guide to gainsharing design and implementation, including checklists, questionnaires, and sample forms	Pro gainsharing bias but reasonably objective articulation of design and development issues	Supervisor's role, leadership. (failure) lack of proper planning, use as carrot, dishonesty, supplement to low wages, use as anti-union measure; (success) help and training given supervisors and other key employees; quality of management; outcome measures; profit, bonuses, return on investment, improved scheduling and delivery, improved quality (reduced cost of quality), increased market share, improved understanding of business, innovation and change, cooperation, increased employment (job security), reduced grievances, reduced turnover and absenteeism, job satisfaction	Good overview of gainsharing. Excellent discussion on how to plan and install a gainsharing program. Sometimes appears "cookbookish"
Graham-Moore and Ross, 1983	A collection of articles on the theoretical aspects of gainsharing and gainsharing design, implementation and development	Reasonably objective, though some authors show pro gainsharing bias	Too much to summarize, however framework is presented that depicts gainsharing success as a function of four, macro-level variables: organizational, socio-cultural-institutional, individual, and financial	Good introduction to gainsharing, especially bonus formula
Dar-EI, 1986	Describes the SHRED COST (Sharing Reductions in Cost) gainsharing program	Attempts to be objective but author's bias as the designer and developer of SHRED COST is apparent	Too much to summarize	A different type of book on gainsharing; for example, an entire chapter is devoted to eliminating waste
Graham-Moore and Ross, 1990	Gainsharing program review and guide to design and implementation.	Reasonably objective	Too much to summarize	Good overview of gainsharing
<i>Empirical Studies</i>				
White, 1979	Investigation of factors that account for variation in Scanlon Plan (SP) success	Objective	SP success was found to be positively related to: (1) the average level of participation in decision making reported by employees; (2) the number of years a company had a SP; (3) managerial attitudes (strongly related to success and whether plan will succeed or fail); (4) the chief executive officer's attitude; and (5) the expected level of success (expectations of instant changes likely will be met with disappointment), success was not related to company size. SP success defined as 1) whether the SP was abandoned or retained and 2) "the extent to which the full effort, experience, creativity, and innovative ability of the entire work force...are directed toward increasing the organization's total effectiveness; * attempts were made to obtain "harder" criterion measures (e.g. cost, cost reduction, profit) and suggestion data but this information was limited by non-comparability across companies	One of the better research studies of gainsharing; well-worth reading; limitations are small sample size (aggravated by missing data), unrepresentative sample, and the fact that the Scanlon Plan is unique in each of its applications
Rosenberg and Rosenztein, 1980	Study examining the relationship between participation and productivity in a unionized foundry	Objective	None identified	Found that participation was more important in increasing productivity than a group bonus plan tied to productivity (this finding counters Geare's, 1976, hypothesis)
Fein, 1983	Reports results of productivity gains experienced by 72 companies with Improshare plans	Pro gainsharing bias	Five plants (three union, two nonunion) discontinued programs because (according to Fein): no productivity teams, and low credibility and trust between management and employees	Was uncomfortable classifying this as an empirical study because it is mostly a journalistic account of gainsharing and Improshare; very concerned with preserving management rights.

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success

General Accounting Office, 1981	Officials of 34 firms nationwide (of which 36 had productivity sharing programs) were interviewed to determine how productivity sharing plans operate, what benefits result, and whether long term productivity increases can be realized through productivity sharing.	Reasonably objective	(Data reported for six unsuccessful firms) Financial difficulties; lack of management commitment or dedication; inadequate design or implementation; little or no bonus payments; failure to develop good communication system between management and labor; insufficient monitoring and attention; use of questionable bonus formula; also employee or union resistance. Outcome measures: increased profits; higher wages; improved employee performance; change in employee's attitudes and job interest; increased productivity; reduction in scrap, rework, and waste; better use of materials, supplies, and equipment; improved labor-management relations, fewer grievances, less absenteeism, reduced turnover, better communication, employee empowerment, management acceptance of employee suggestions	Study was difficult to summarize because interview data was not used or reported consistently; however, study is worth reading
Schuster, 1983	A multiple case (nine plants), longitudinal study that examined the effects of union-management cooperation programs on productivity and employment	Objective	Stimulus to change a traditional bargaining relationship (e.g. dire financial position or desire to create an improved workplace environment, improve communication, or enhance compensation program); maintenance of a sense of equity via regular bonus payments; key management and supervisory personnel must share the goal of cooperative effort and willing to share their authority to make decisions; involve union leadership; education and training	Although the study is not gainsharing program specific, six of the nine research sites used a gainsharing program as their cooperative program; worthwhile reading
Schuster, 1984	A longitudinal analysis of the Scanlon Plan (SP) in a manufacturing plant of a large, multinational corporation	Objective	The "elaborate structure" for employee participation; the role of the consultant in bonus plan development; information sharing; coordination of implementation by supervisors; training programs that encouraged and rewarded personal growth and development; suggestion acceptance rate; job restructuring; employees expressed a desire for additional responsibilities; management and union acceptance; equitable distribution of benefits; corporate encouragement; the desire of management to motivate an older work force, management's desire to improve productivity, and management's belief that employees could contribute and this could best be accomplished by extensive employee involvement; SP effectiveness defined as increased productivity (measured as output per hour), stable employment, reduced voluntary turnover, and improved product quality; time series data revealed productivity increased and interview data revealed that lower labor costs improved plant's cost	Provides a long-term evaluation of the SP over a five to six year period; used both quantitative and qualitative data (interviews); well-worth reading
Ross, Hatcher, and Adams, 1985	A survey of high-ranking union officials concerns about gainsharing plans - what they find objectionable and what they find attractive	Reasonably objective	Five most important reasons for opposition: (1) management may try to substitute it for base wages, (2) management cannot be trusted, (3) peer pressure to perform may increase, (4) bonus calculations are not understood or trusted, (5) union influence is undetermined. Five most important reasons for support: (1) increased recognition, (2) better job security; (3) increased involvement in job activities; (4) more money, and (5) increased feeling of achievement of contributing to the organization	One of a few studies that focuses on unions in the context of gainsharing programs (see Driscoll, 1979; Schuster, 1983 and 1985)
Schuster, 1985	Reports selected findings from a longitudinal study of 33 union-management programs in manufacturing industries and evaluates a model of cooperation and change using these data	Objective	Union involvement, communication of structure and operation of program to employees; from both a labor and management perspective, the need for and degree of cooperation are based almost entirely on pragmatic concerns: need to improve productivity, increase wages, strengthen economic well being, address pay system difficulties, solve other organizational problems; perceived usefulness of the change; risk of inequity; degree of departure from traditional labor-management relations; paradigms (the manner in which issues are approached); parties are paralyzed by past events and a lack of mutual trust, company communications are seen as lacking credibility, union leaders views as unwilling to address difficult problems; perceived sincerity of effort; implementation strategy; perceptions of equity. Outcome measures: cooperation, higher productivity	A lot of good insights on labor-management relations; not gainsharing program specific, but well-worth reading

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success

General Accounting Office, 1986	Data collected on 18 gainsharing programs implemented in February 1986 and three DOD gainsharing programs being developed at that time	Appears objective; relied mainly on questionnaire and interview data, comparison with private sector studies	Critical elements: continuous and visible top management support; employee participation systems to elicit and act upon work improvement ideas; definable and accurate measures of performance; adequate workloads to absorb productivity increases; other elements: information sharing between participating parties; union participation; continuous feedback to employees on performance; and the availability of parts and materials to accomplish the work. Outcome measures: cost savings; some installations reported indirect benefits: sick leave usage, reductions in work backlogs, and overtime costs	Definition of gainsharing program included wide range of programs, from individual-based to organizational based
Hausk, 1987	Study to determine the relative importance of criteria for evaluating the appropriateness of a gainsharing calculations for bank branches	Reasonably objective but pro gainsharing bias evident in introduction and conclusion	Conditions for success - identity (common goals), involvement, equity, and competent management - are identified in the author's description of productivity gainsharing (see Frost, Wakely, and Ruh, 1974)	Interesting approach for evaluating types of gainsharing calculations; nothing new or different in regards to gainsharing program success or failure as a result of this study
Miller and Schuster, 1987	A longitudinal analysis of the Scanlon Plan (SP) in a manufacturing plant of a large, multinational corporation.	Objective	Willingness of middle managers to commit; size of work force and vast committee system did not seem to hinder SP, neither did the absence of financial difficulties or the fact the workplace was highly automated; however, management officials disagreed over whether SP had actually increased productivity; there was considerable consensus that SP improved union-management relations	A follow-up, research note to Schuster, 1984
Mohrman, Jr., Ledford, Jr., and De-mming, 1987	A longitudinal case study on the effectiveness of gainsharing in the context of a high involvement organization design at TRW Otwell Cable Division	Objective but suspect subtle bias because the researchers were involved in the project	None identified	Tested a set of hypotheses on the direct and indirect effects of gainsharing on cognitions, attitudes, behaviors, and objective outcomes; interesting reading
O'Dell and McAdams, 1987	A survey of compensation practices conducted by the American Productivity Center; 223 firms (14 percent of the total sample) responded to the section of the survey on gainsharing	Objective; however, there is probably response bias or sampling bias toward innovative firms (or both)	None identified	Provides nice overview of the types of organizations with gainsharing programs and current gainsharing practice
Levine and Tyson, 1990	An examination of worker participation on productivity	Objective	Participatory arrangements work best where there are four mutually supporting pillars: (1) profit sharing or gainsharing; (2) guaranteed long-term employment; (3) relatively narrow wage differentials; (4) guarantees of worker rights	Reviews and integrates the disparate empirical evidence on participation-productivity relationship
Mitchell, Lewin, and Lawler, 1990	Focus on the possible contribution of alternative pay systems applied to non-supervisory employees to microeconomic performance	Objective but may have response bias in data set	No causes or correlates of success investigated; found that employee participation and profit sharing for production workers have positive effects on productivity (workers on profit sharing or incentives are more productive than workers on straight wages); fail to detect positive interaction between participation and profit sharing that case studies suggest	Provides informative history of thinking on and experience with alternative compensation systems; nice overview of literature and theoretical perspectives
Wietzman and Kruse, 1990	An examination on whether profit sharing (defined to include gainsharing) increases productivity	Objective	Discussed three theoretical issues (free-rider problem, risk aversion, codetermination) in profit sharing-productivity relationship; concluded profit sharing raises productivity (consistent, but weak, support)	Hold view that an abundance of weak evidence can add up to strong case if it all points in the same direction; nice overview of profit sharing literature

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success
Review/Integrative/Theoretical Articles

	Reasonably objective	None identified	Suggests potential applications of basic calculations to service sector industries; see Hauck, 1987
Hauck, 1982	Review of basic gainsharing calculations		
Moore, 1982	A Work in America Institute study on productivity gainsharing		
Bullock and Lawler, 1984	Conceptual model used to review the case study literature on gainsharing	Reasonably objective	Model presented is more a heuristic device for cataloging existing information; vague causal statement. Hypothesize that gainsharing changes culture.
Ringham, 1984	Guide to program design	Reasonably objective	Good review of design issues
Ross and Hauck, 1984	Review of gainsharing practice in the U.S.	Reasonably objective	Nice review of gainsharing programs
Ross and Ross, 1984	Basic types of gainsharing calculations are explained, and the issues involved in refining them are discussed	Pro gainsharing bias but reasonable articulation of measurement issues	Worthwhile reading; identify disadvantages and potential types of gainsharing measure
Ross and Keyser, 1984/85	Principles of gainsharing and different views of its problems and opportunities are explored	Suspect gainsharing bias	Identifies three types of companies implementing gainsharing; in trouble; already successful; desire greater variable compensation
Smith, 1986	Review of Scanlon Plan	Pro gainsharing bias	Nothing new, nothing much
Tarbell, 1986	Discussion of gainsharing in context of safety	Pro gainsharing bias	Nothing much
Dulworth and Usilaner, 1987	A comparison of gainsharing systems in the federal government with those in the private sector	Pro gainsharing bias	Study mostly draws on two General Accounting Office Studies (GAO, 1981 and 1986); distinguished between financial gainsharing and participative gainsharing
Florkowski, 1987	A model of profit sharing is presented to foster improved research	Objective	A must read; model developed is casual, correlational type and appears grounded in psychological view of organization

Table A-2 Continued. Causes and Correlates of Gainsharing Program Success

	Objective	None provided	
Miller and Schuster, 1987	A comparison of six gainsharing plans and suggestions for choosing the best one for a specific application; based on qualitative data collected as part of a study of 60 U.S. and 20 British companies with quality-of-worklife programs		Pretty good; describes each gainsharing program along 11 different dimensions ranging from philosophy/theory to frequency of bonus sharing
Ross, Hatcher, and Ross, 1987	Review of four major steps in the training of managers necessary for the success of gainsharing	Some pro gainsharing bias	Management's ability to adapt to new approach and roles
Schuster, 1987	Provides a framework for deciding whether gainsharing is appropriate for an organization and guidelines for implementation	Objective	Appear to be four keys to success: (1) defining the program's strategic objectives; (2) devoting sufficient time to feasibility assessment and plan design; (3) commitment to the concept at all managerial levels; (4) effective implementation; feasibility factors are: measures, size, type of production, work-force interdependence, work-force composition, potential to absorb additional output, potential for employee efforts, history, organizational climate, union-management relations, capital investment plans, facility management, higher management support
Thor, 1987	An overview of gainsharing and productivity; the rationale for installing a program; and key planning, design, and formula issues	Reasonably objective	Difficult to summarize succinctly
Hammer, 1988	Review of gainsharing research and presentation of model that shows how components of gainsharing programs influence productivity outcomes	Objective	None provided. Focuses on how gainsharing works: bonus payment promise (redefined work-effort bargain); participation, which leads to (1) a set of accepted, specific work performance goals, increased worker effort, and a more efficient organization of work, (2) intrinsic motivation, and (3) employee empowerment through access to information; bonus payments and empowerment lead to trust in management and commitment to gainsharing program
Lawler, 1986 (also see Lawler, 1981 and 1990 - not reviewed here)	Discussion of gainsharing in the context of high-involvement management	<i>Gainsharing Discussion in Performance Management Literature</i> Reasonably objective	Emphasis placed on the labor exchange; good review of gainsharing research and developed is casual, correlation-type
Grayson and O'Dell, 1988	Discussion of gainsharing in the context of competitive compensation strategies	Reasonably objective	Entire book is worthwhile reading; does provide a list of costs (both financial and nonfinancial) associated with gainsharing programs as well as typical outcomes and benefits
Kanter, 1989	Discussion of gainsharing in the context of new organizational practices	Reasonably objective	Presents an agenda for management; a very good book
			Provides insight to issues involved with profit sharing and gainsharing

Table A-3. Major Categories of Causes and Correlates of Gainsharing Program Success

Values, Beliefs, Attitudes, Agendas	Management Practices	Participation, Involvement	Performance Measurements	Information Sharing, Feedback	Bonus Payments	Program Support	Organizational Characteristics	Workforce Characteristics
<i>Case Studies</i>								
Chamberlain, 1946							Single union; Physical factor dominated	
Davenport, 1950		Competent union leadership; Top management champion						
Daignault, 1952		Management sanction						
Gilson and Lefcowitz, 1957	Sincere commitment to participation		Appropriate				Underlying problems dealt with	Minimum level of job/career involvement
Jehring, 1967							Stable product mix; labor content	
Nordrup and Young, 1968		Shortsightedness (-)						
Gray, 1971							Basic industrial conflict (-)	
Driscoll, 1979	Management acceptance of collective bargaining; management, union, and worker acceptance of program	Top management support; follow-up efforts to avoid plateauing	Group to solve production problems; optional modes for individual contribution; formal structure	Program explanation	Immediate, visible, and tangible	Consultant with development skills and collective bargaining expertise	Maintenance of existing balance of power	
Bullock and Bullock, 1982			Group-based system	Financial, simple; satisfaction with and understanding of	Weekly and monthly reviews; rapid suggestion processing		Trust in top management	
Ramquist, 1982	Management willingness to involve employees, relinquish prerogatives, share information		Includes staff	Accurately reflect performance		Employee education and training on jobs and business		
Rauglas, 1985		Participative						
Ross, Ross, and Hatcher, 1986	Management's sincere commitment	Union involvement		Financial disclosure				
Hatcher, Ross, and Ross, 1987		Participative		Open network; Rapid feedback on suggestions				

Table A-3 Continued. Major Categories of Causes and Correlates of Gainsharing Program Success

	Values, Beliefs, Attitudes, Agendas	Management Practices	Participation, Involvement	Performance Measurements	Information Sharing, Feedback	Bonus Payments	Program Support	Organizational Characteristics	Workforce Characteristics
Jewell and Jewell, 1987	Management beliefs and values (?)	Competent management; management sanction	Mechanism to involve employees in business	Closely tied to key performance areas	Ongoing; portrayed in easily understood format				
Markham and Scott, 1988							Skilled gainsharing coordinator		
<i>Empirical Studies</i>									
Wallace, 1971 (Rub, Wallace, and Frost, 1973)	Managements' confidence in employee ability and willingness to participate								
Burtnett, 1973					Accurate and timely information				
NCPQWL, 1975 (Moore and Goodman, 1973)		Emphasis on participative process	Mechanisms to deal with nonproductive suggestions and encourage good suggestions	Simple bonus formula	Well-communicated bonus formula		Dealing with potential role ambiguity of foreman and indirect workers		
White, 1979	Managers' and CEO's attitude favorable; realistic expectations for success		Level of involvement in decision making					Age of program	
GAO, 1981	Employee or union resistance (-)	Lack of management commitment and dedication (-)		Questionable bonus formula (-)	Failure to develop communication system between management and labor (-)	Little or none (-)	Inadequate program design and implementation (-); insufficient monitoring and attention (-)	Financial difficulties (-)	
Fein, 1983	Management believes in involving workers, confident workers can contribute		No productivity teams (-)					Low credibility and trust between management and employees	

Table A-3 Continued. Major Categories of Causes and Correlates of Gainsharing Program Success

	Value, Beliefs, Attitudes, Agendas	Management Practices	Participation, Involvement	Performance Measurements	Information Sharing, Feedback	Bonus Payments	Program Support	Organizational Characteristics	Workforce Characteristics
Schuster, 1983	Economic push or noneconomic pull; and supervisory personnel must share the goal of cooperative effort and willing to share their authority to make decisions;	Union leadership involvement	Economic push or noneconomic pull			Maintenance of a sense of equity via regular bonus payments	Education and training		
Schuster, 1984	Non-economic pull; and union acceptance; corporate encouragement; management's belief that employees could contribute and this could best be accomplished by extensive employee involvement	Coordination of implementation by supervisors	Elaborate structure		Information sharing; suggestion acceptance rate	Equitable distribution of benefits	Consultant role in bonus plan development; training programs that encouraged and rewarded personal growth and development; job restructuring		Employees expressed a desire for additional responsibilities;
Ross, Hatcher, and Adams, 1985	Substitute for base wages (-); better job security	Increase peer pressure to perform (-)	Increased involvement in job activities	Bonus calculation not understood or trusted (-)		More money		Management cannot be trusted (-); union influence undermined (-)	
Schuster, 1985	Economic and noneconomic push and pull; sincerity of effort	Union involvement			Lack credibility (-)	Risk of inequity (-)	Communication of structure and operation of program	Departure from traditional labor management relations (-); past events and lack of trust (-)	
GAO, 1986		Continuous, visible top management support	Participation systems to elicit and work on ideas	Definable, accurate	Information sharing; continuous feedback			Ability to absorb increased workloads; availability of parts and materials	

Levine and Tyson, 1990
 Mitchell, Lewin, and Lawler, 1990
 Wietzman and Kruse, 1990

APPENDIX B:
RESEARCH METHODOLOGY MATERIALS

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March 19, 1991

Mr. Bob Hutchinson
Commonwealth Paper
P.O. Box 000
Woodlands

Dear Bob:

Thank you for your willingness to participate in my doctoral dissertation.

The purpose of my research is to create a clear picture of how a gainsharing program really works to affect company operations. This picture would depict the key elements of a gainsharing program and the cause-and-effect relationships among these key elements. Once this picture is created, it could be translated to a simulation model to see what might happen to a gainsharing program over time. Individuals and groups accountable and responsible for a gainsharing program's design and development could then ask "What if?" questions and experiment with new program policies. The picture, or visual model, however, is worthwhile in and of itself because it provides one with a gestalt view and understanding; it is also an important, first step towards the development of a simulation tool for gainsharing program design and development. (I got this idea from a book entitled, *The Fifth Discipline: The Art & Practice of the Learning Organization*, which you might find both interesting and of practical use. It's written by Peter Senge and published by Doubleday; the cost is \$19.95 from a bookstore. The ISBN number is 0-385-26094-6. The enclosed article describes the book's content and has ordering information at the end.)

I expect to have the dissertation proposal completed by week's end. The proposal outlines what I plan to do and must be approved by my dissertation committee before I can proceed with the research. Allowing time for changes, I expect to have a green-light sometime in mid-April (I will send you a copy of the completed proposal). We could safely plan on the research beginning the first week of May. Final exams end at Virginia Tech May 1, so the entire month of May is open for me. Following is my wish list in regards to your's and other people's time; of course, I will work within your's and others' time and resource constraints.

What I propose to do is to have you, and two to five other key people, tell me how Commonwealth Paper's gainsharing program works to affect operations. By a key person, I mean someone that meets one or more of the following criteria:

- Position - someone, who by nature of their position, has a relatively broad view of the gainsharing program.

- Reputation - someone considered by yourself or others as “ a good person to talk to about the gainsharing program.”
- Participation - someone that participates in the design and application of the gainsharing program.
- Opinion leadership - someone who tends to shape others opinions regarding the design and application of the gainsharing program.

The time commitment for each individual interview (or, if preferable, a group interview) would be in the neighborhood of two to four hours, which could be spread out over several sessions. As we discussed over the phone, I prefer to spend four hours each with three people than one or two hours each with six people. Each person interviewed would then need to spend a half-hour reviewing certain pieces of the transcript of her or his interview, checking its accuracy, and making any required modifications. I'll use this interview data to create a visual model of the key elements and relationships in Virginia Fibre's gainsharing program. A copy of this model would then be sent to each person interviewed for review and comment. If at all possible, I would like you to attend the dissertation defense meeting, either in person or by phone, sometime in August.

In closing, I'd like to again thank you for your willingness to participate in the research. I'll give you a call the week of March 25th so we can begin to work on logistics.

My Best Regards,

Paul E. Rossler

DATA SOURCES

Interviews with President Allen, Mill Manager Bauer, Maintenance Manager Daniels, Human Resource Manager Hutchinson, Financial Manager Kohler, Operations Manager Russell

Field Notes taken during 4th Working Day Meeting (5-6-91), interviews (5-7-91), and 1991 Strategic Planning Session: (12-12 and 13-91).

Annual Reports to Employees: October 1986, October 1987, January 1989, December 1989, December 1991

Annual Strategic Plans: September 1988, 1989, 1990

Daily Operations Report 5-6-91 and 5-7-91

Employee Handbook

Human Resource Report, May 1991

Information System Description

Information Sharing Practices Description (Van Aiken, 1991)

Medium Quality Report

Mill Modernization/Expansion Plan

Performance Management Assessment (Kiser, 1989, 1990, 1991)

President Allen's presentation on incentive compensation program changes

President's Operating Committee's list of items having an effect on daily production, either increase or decrease

Process Description

Salary and Grade Structure

Statistical Process Control data for production tonnage: May 1990, April 1991

Training Needs Assessment Report, January 1989

interview guide

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June 26, 1991

Mr. Bob Hutchinson
Commonwealth Paper
P.O. Box 000
Woodlands

Dear Bob:

The Hutchinson-Kohler interview tape has finally been transcribed and is enclosed. A copy has also been sent to Barry. I apologize for the long delay in getting this to you.

To make certain that I correctly captured and documented what you had to say, I'd like you to read through the transcript and correct anything that is inaccurate, fill in missing words or phrases (which are indicated by a blank line), and provide clarification for those parts of the interview which don't seem to convey what you had intended. Also, if you would like to take this opportunity to add something, you can write it in the margins, on the back of a page, or on the blank sheet found at the end of the transcript. If you have extensive additions, and don't have the time to write them, please give me a call (703-381-0302) or use the cassette tape provided. At the top of the transcript, please indicate whether it would be okay to publish the transcript, in an anonymous format, in the appendix of the final report.

Please return the marked-up transcript to me in the enclosed, self-addressed envelope no later than Friday, July 12. (I know the shutdown is occurring in late July and it may not be possible for you to review the transcript before then. Just let me know if this is the case.) Once I receive it, I'll begin combining your interview with the other interviews to create a model of how gainsharing works to impact company performance at Virginia Fibre. You'll receive a copy of this model and its accompanying narrative for your review and comments in mid- to late-August.

Once again, thank you for your participation in this project.

My best regards,

Paul E. Rossler

VIRGINIA TECH

Paul E. Rossler
Industrial and Systems Engineering

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August 19, 1991

Dear

The attached narrative (Attachment A) and accompanying pictures (Attachment B-G) were created based on your description and others' descriptions of how the gainsharing incentive program at Commonwealth Paper works to affect company performance. I need your help in showing me where these pictures are incomplete or mistaken, and where they need to be revised for more accuracy. I'll be visiting with each of you the afternoon of August 27th so that this can be accomplished. So that you will know what to expect and can be better prepared for that meeting, for each picture I'll be asking you:

- A. Overall, how accurate do you consider the picture to be? That is, does the story it tells make sense? Please say a little about why you think so.
- B. Are there any important elements missing? Either list or draw them on the picture or do both.
- C. Are any of the elements unimportant, trivial, or of little effect? Cross them off the picture and say a little about why you think they are of little value.
- D. Do you think the arrows between elements are accurate, both in direction and polarity (a "+" if increasing or decreasing together, a "-" if one increases and the other decreases or vice versa)? If not, cross off the arrows, draw in new arrows (be certain to indicate the polarity), or correct the polarity.
- E. Any other concluding comments or suggestions.

Once again, I'd like to thank you for your help in this project. I'm looking forward to my visit.

Best Regards,

Paul E. Rossler

ATTACHMENT A

How to read a systems picture

Every systems picture tells a story. When reading a systems picture, the main skill is to see the story being told. From any element in the picture, you can trace arrows that represent influence on another element. Where an increase (or decrease) in one element influences an increase (or decrease) in another element, the arrow is drawn with a “plus sign.” Where an increase in one element influences a decrease in another element (or visa versa), the arrow is drawn with a “negative sign.” Implicit in any arrow relationship is the condition “all other things being equal.” In addition, the arrow relationships do not have to be linear relationships.

The systems picture that was built to show how the gainsharing program incentive program works to impact performance at CP is comprised of six, smaller pictures (Attachments B - G): (1) Paper Production; (2) Financial Performance; (3) Compensation; (4) Participation; (5) Information Sharing; and (6) Incentive Bonus. Below are the stories for these sectors. All six sectors, when considered together, show how the gainsharing incentive program impacts performance at Commonwealth Paper.

Attachment B Systems Picture Story (The Production Sector)

The paper machine production rate is influenced by product characteristics, production effort, and production capability. Product characteristics, like weight, percentage of recycled fibre, and quality requirements, are mostly determined by the marketplace. Production-focused effort, on the other hand, is mostly determined by managers, operators, and mechanics. As the perceived need to increase production increases, so does production-focused effort.¹ This perceived need to increase production is influenced in part by the production gap, the difference between the annual daily production goal established at the beginning of each fiscal year and the average level of production achieved. As this production gap increases, so does the perceived need to increase production. Because the paper production process is capital intensive, additions to production capability influence the paper machine production rate. The capability gap influences the perceived need to invest in capability. As the capability gap increases, so does the perceived need to invest in capability. Because CP wishes to remain debt free, additions to production capability are limited by available cash flow. These variables and relationships described above are shown in Attachment B (center and right side of figure).

As running time increases, paper machine production increases. Increases in running time are achieved through reductions in lost time. The lost time gap, the difference between the lost time goal established at the beginning of each fiscal year and the lost time achieved, as

¹The modifier “perceived” is used here to highlight the subjective reality that operates in an organizational setting. Need, as used here and throughout these system picture descriptions, is synonymous with concepts like necessity, requisite, and desire. It includes both external requirements as well as internal compulsions. The word should not be interpreted in a strict, psychological sense. In earlier model versions, the word “pressure” was used instead of need. Pressure, however, implied more of “push” phenomenon rather than the “push and pull” that seems to be occurring.

well as the production gap, influences the perceived need to reduce lost time. As the lost time gap increases, so does the perceived need to reduce lost time. As the production gap increases, so does the perceived need to reduce lost time. The perceived need to reduce lost time influences both maintenance focused effort and reductions in lost time. As maintenance focused effort increases, and as reductions in lost time increase, lost time decreases. Reductions in lost time also influence maintenance frequency. The variables and relationships described above are shown in Attachment B (left side of figure).

Attachment C Systems Picture Story (The Financial Performance Sector)

The net selling price and paper machine production determine revenues. Revenues less costs, which also fluctuate with paper machine production, determines available cash flow. As the gap between cash flow requirements and available cash flow increases, the perceived need to increase production increases. The perceived need to increase production is also influenced in part by the budget performance gap and the comparison mill financial performance gap. As these gaps increase, the perceived need to increase production increases.

Attachment D Systems Picture Story (The Compensation Sector)

Managers' and employees' total reward is determined by base pay and premium pay, incentive bonus earnings, and benefits. As the manager-employee reward gap grows and as the operator-mechanic reward gap grows, labor-management polarization and operator-maintenance polarization occurs. This polarization influences the shared perceived need to increase production, reduce lost time, and invest in production capability, and influences work rules that either enlarge or reduce opportunities to increase production-focused and maintenance-focused effort.

Attachment E Systems Picture Story (The Participation Sector)

The time required for paper production and the time required for involvement influence the time available for involvement, which in turn influences the level of involvement. The level of involvement is also influenced by managements' desired level of involvement (which is a function of management style) and the perceived need to participate on employees' part. The perceived need to participate may be influenced by performance expectations and the perceived need to increase production and reduce lost time. As the level of project involvement increases, both project quality and project-focused (or implementation-focused) effort increases. Because of improved project quality and an increased level of project-focused effort, the delay between additions to production capability and increases in the paper machine production rate, and the delay between planned reductions in lost time and actual reductions in lost time is cut short. As these projects are implemented, more time is freed-up for involvement because of improved process control.

Informal participation (see inset in upper right of Attachment E) occurs daily as individuals and groups go beyond narrow job descriptions and perform at levels higher than needed to "just get by.". Ingrained in the culture is the expectation that everyone contributes all that they are able, day-in and day-out. This expectation came about as a result of decisions made to be leanly staffed, resulting in fewer layers of bureaucracy. Fewer layers of bureaucracy allows more people to perceive an influence on results.

Attachment F Systems Picture Story (The Information Sharing Sector)

The performance gaps identified in the production sector (Attachment B) and financial sector (Attachment C) are more accurately labeled as “perceived” performance gaps, as shown on the right side of Attachment F. The amount of information shared with everyone helps influence shared performance perceptions so that everybody is working toward the same end. That is, there is a shared, perceived need to increase production, reduce lost time, and invest in capability. One performance perception in particular, the production gap, is closely related to the gainsharing incentive program. That is, the production gap, in the minds of a lot of employees, translates to an incentive bonus gap. As the incentive bonus calculation increases in complexity, it becomes more difficult for people to see the production gap - incentive bonus gap relationship. The amount of information shared not only influences performance perceptions, but also influences labor-management polarization. The way in which labor-management polarization is influenced by the amount of information shared is in alleviating uncertainty. Uncertainty is the difference between the amount of information desired and the amount of information available or shared.

Attachment G Systems Picture Story (The Incentive Bonus Sector)

The average daily production, incentive base production tonnage, and the bonus percentage production increment (i.e. the additional tons that must be produced before the next bonus percent is earned) determines the incentive bonus percent earned, and eventually paid (upper right of Attachment G). The incentive bonus earned influences the bonus expectations, which play a part in adjusting the incentive bonus calculation.

The perceived influence on bonus results (center of Attachment G) is influenced by the incentive base production tonnage, the bonus percentage production increment, the layers of bureaucracy, and incentive bonus complexity. As these increase, the perceived influence on bonus results decreases. As the perceived influence on bonus results decreases, so does the perceived need to increase production, invest in capability, and reduce lost time.

The incentive bonus percent earned influences the incentive bonus percent paid (left center of Attachment G). The financial ability to pay the bonus percent earned also influences the incentive bonus percent paid. As the gap between the bonus earned and the bonus paid increases, uncertainty increases (e.g. takeaway fears), and labor-management polarization eventually occurs. As labor-management polarization increases, the shared, perceived need to increase production, invest in capability, and reduce lost time decreases.

As the incentive bonus percent paid increases, the perceived need for the incentive increases (lower left of Attachment G). As the perceived need for the incentive increases, the perceived need to increase production, invest in capability, and reduce lost time increases. In addition, the incentive bonus percent paid influences the ability to hire and hold quality people. Workforce quality (as measured in both skill and experience) leverages both production-focused and maintenance-focused effort.

**APPENDIX C:
LIMITS TO GROWTH STRUCTURE DESCRIPTION**

The limits to growth structure is depicted in Figure C-1. In each case of limits to growth, there is a reinforcing process of growth or improvement that operates on its own for a period of time. The reinforcing process produces to one degree or another the desired condition, but it also creates secondary effects (manifested in a balancing process). This balancing process operates to limit the growth or improvement. Quality circle programs are an example of limits to growth (see Figure C-2):

Many initial attempts to establish quality circles fail ultimately in U.S. firms, despite making some initial progress. Quality circle activity begins to lead to more open communication and collaborative problem solving, which builds enthusiasm for more quality circle activity. But the more successful the quality circles become, the more threatening they become to the traditional distribution of political power in the firm. Union leaders begin to fear that the new openness will break down traditional adversarial relations between workers and management, thereby undermining union leaders' ability to influence workers. They begin to undermine the quality circle activity by playing on workers' apprehensions about being manipulated and "snowed" by managers...

Managers, on the other hand, are often unprepared to share control with workers whom they have mistrusted in the past. They end up participating in quality circle activities but only going through the motions. They graciously acknowledge workers' suggestions but fail to implement them.

Rather than achieving steady acceptance, quality circle activity rises for a time - then plateaus and declines. Often the response of the leader to disappointing results from the quality circle simply feeds fuel to the flame. The more aggressively the leader promotes the quality circle, the more people feel threatened and the more stonewalling takes place (Senge, 1990, pp. 99-100).

The quality circle experience is not unique among improvement programs. Yet, a limits to growth structure does not mean that all programs in all organizations will rise, stabilize, and decline. There are improvement programs — and quality circles are no exception — which are practiced successfully, in a wide variety of organizations, over long periods of time. However, successful program application does not mean an absence of

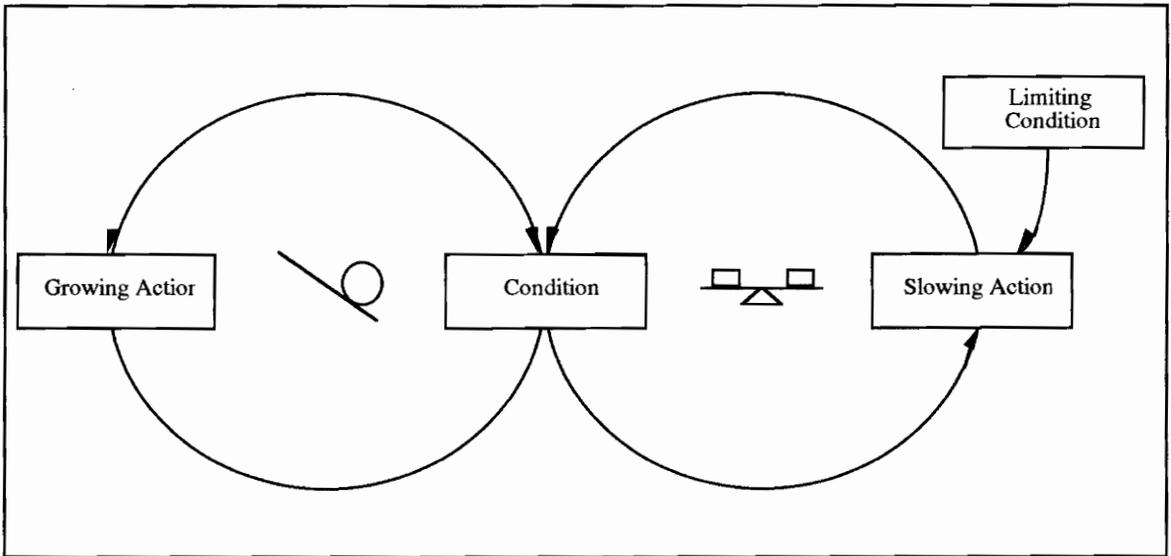


Figure C-1. The Limits to Growth Structure (Source: Senge, 1990)

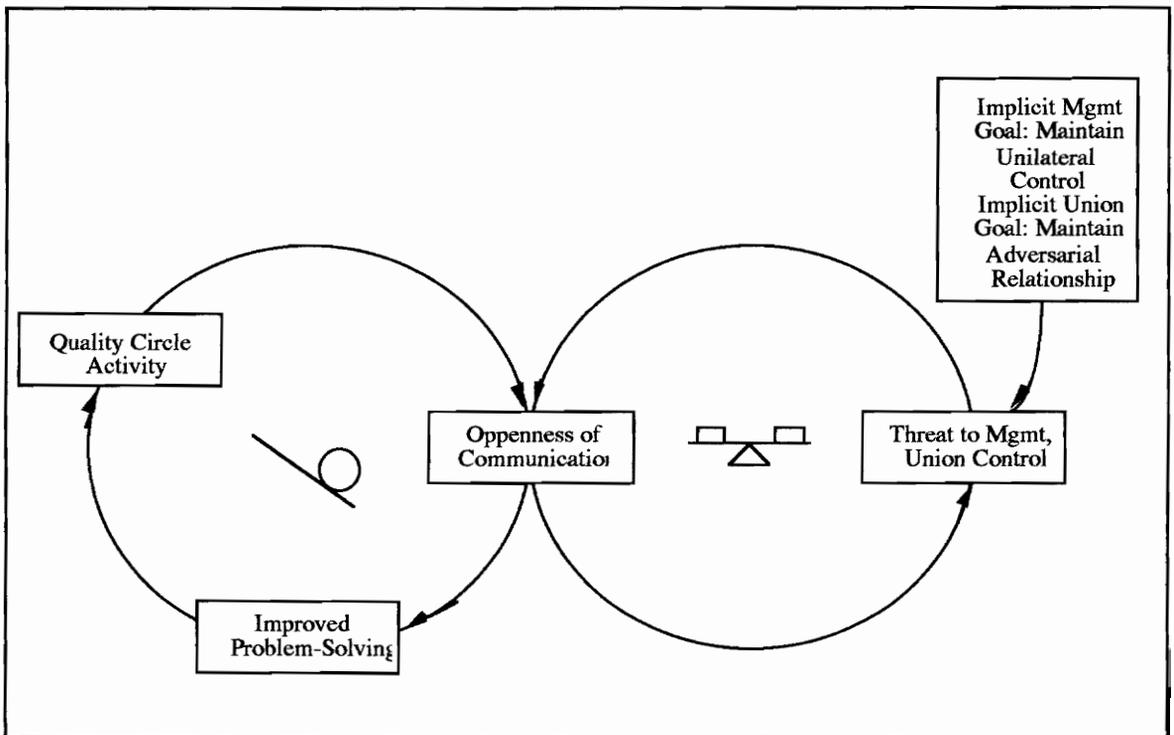


Figure C-2. Quality Circle Program's Limits to Growth (Source: Senge, 1990)

problems. Because improvement programs follow a limits to growth structure, all improvement programs eventually develop problems (i.e. they bump up against limits to growth) (see Senge, 1990: 6). To eliminate the problem and its effects, the limiting factor must be identified and changed (Senge, 1990, p.101); in other words, the leverage in a limits to growth structure lies in the balancing loop, not the reinforcing loop.

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EDUCATION

- Ph.D. Industrial and Systems Engineering (Management Systems), Virginia Polytechnic Institute and State University, November 1991
- M.S. Industrial Engineering and Operations Research (Management Systems), Virginia Polytechnic Institute and State University, February 1988
- B.S. Industrial Engineering, General Motors Institute, June 1984

AREAS OF RESEARCH AND TEACHING

Quality and productivity management and improvement, performance measurement and information, compensation management, performance improvement planning, organizational change and learning, improvement program design, industrial engineering and management history.

PROFESSIONAL EXPERIENCE

- 1/92 - Present Visiting Professor, Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University. Teach graduate-level, televised course on management information systems and teach sophomore-level, introductory course on industrial engineering.
- 8/91 - 12/91 Teaching Assistant, Theory of Organization (Senior-level elective, 50 students), Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University. Graded tests and management game exercises; Conducted class in professor's absence.
- 5/91 - 7/91 Performed dissertation research. Reviewed and critiqued drafts of *Total Quality Management* by Marshall Sashkin and Kenneth J. Kiser (Ducochen Press, September 1991).

- 1/91 - 4/91 and
1/90 - 4/90 Instructor, Compensation Management (Senior-level elective, 26 students in Spring 90, 21 students in Spring 91), Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University. Redesigned course for semester system in December, 1990; Selected textbooks and readings; Developed case study material; Facilitated participative learning modules.
- 1/88 - present Guest Lecturer on performance management topics at both undergraduate and graduate level (average of two invited lectures per semester).
- 8/90 - 12/90 Teaching Assistant, Introduction to Industrial Engineering (85 students). Lectured on performance measurement, compensation management, quality management, cost management, and methods engineering; Designed homework assignments; Designed test questions; Graded homework assignments and tests.
- 12/85 - 7/90 Research Associate, Virginia Productivity Center, Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University. Researched and developed management systems in the areas of performance management, compensation, performance measurement, and performance improvement plan development and implementation; Prepared research and development proposals; Served as co-principal investigator, associate investigator, and project manager on research and development projects sponsored by public and private sector organizations; Authored and co-authored publications to transfer knowledge gained through research and development efforts; Managed internal center operations as member of management board; Chaired the compensation committee.
- 8/85 - 12/85 Teaching Assistant, Engineering Economy (90 students). Led three recitations per week; Graded homeworks and tests.
- 12/83 - 8/85 Systems Engineer, Manufacturing, Detroit Diesel Allison Division of General Motors Corporation. Studied and improved work processes; Designed, engineered, and implemented computer systems for the Manufacturing Engineering Function.
- 7/79 - 11/83 Co-op student, Detroit Diesel Allison Division of General Motors Corporation.

PROFESSIONAL CONTRIBUTIONS

Invited Papers

Rosler, P. E. and Sink, D. S., A Roadmap for Quality and Productivity Improvement, *Engineering Management Journal*, September 1990.

Rossler, P. E., The Motivation Merry-Go-Round, *Quality and Productivity Management*, 8(4), 1990.

Papers and Book Chapters

Rossler, P. E., Challenging Mainstream IE Thinking, *Industrial Engineering*, September 1991.

Rossler, P. E. and Sink, D. S., What's Ahead for Quality and Productivity, *Industrial Engineering*, May 1990.

Sink, D.S. and Rossler, P. E., (Principal Authors), *Managing Quality and Productivity in Aerospace and Defense*, Fort Belvoir, Va: Defense Systems Management College, 1988.

Rossler, P. E. and Sink, D. S., Compensation Management Systems in the Organization of the Future: The Role of Gainsharing, IIE Spring Conference *Proceedings*, 1988.

Rossler, P. E., Cox, W. G. and Chase, T. D. Multi-Factor Productivity Measurement in Manufacturing, IIE Fall Conference *Proceedings*, 1987.

Sink, D. S. and Rossler, P. E., Performance Measurement and Evaluation: Who for, What for, Tools and Techniques, IIE Spring Conference, 1987.

Sink, D. S., Rossler, P. E. and Dhir, A. K., An Update on the Study of Productivity Measurement and Incentive Methodology, in *Productivity Management Frontiers I* (David J. Sumanth, Ed.), Elsevier, 1987.

Sink, D. S., and Rossler, P. E., Development of a Guide to Quality and Productivity Management for U.S. Defense Contractors, IIE Fall Conference *Proceedings*, 1987.

Rossler, P. E., Improving Your Performance Measurement Systems, IIE Spring Conference *Proceedings*, 1987.

Theses and Dissertations

Rossler, P. E., *A Hypothesized, General Causal Model of a Gainsharing Program*, Blacksburg, Va: Virginia Polytechnic Institute and State University, November, 1991.

Rossler, P. E., *Using a Productivity Measurement Model to Drive Gainsharing*, Unpublished Master Thesis, Blacksburg, Va: Virginia Polytechnic Institute and State University, January, 1988.

Rossler, P. E., *Model Mix Sequencing of Diesel Engines*, Unpublished Undergraduate Thesis, Flint, Mi.: General Motors Institute, June, 1984.

Presentations

A Comparison of Taylor's Scientific Management with Deming's Quality Management, Department of Industrial Engineering and Management, Oklahoma State University, September, 1991.

The Performance Improvement Theme Park, Department of Industrial Engineering, University of Central Florida, April, 1991.

Gainsharing: When is It Appropriate?, Panel discussion, Georgia Productivity Center Conference, October 1988.

Managing Quality and Productivity in Aerospace and Defense, presented at the American Productivity Management Association Conference, June 1988.

Compensation Management Systems in the Organization of the Future, presented with Dr. D. Scott Sink at the Institute of Industrial Engineers Spring Conference, May 1988.

Lessons Learned in Managing Quality and Productivity, moderator for panel discussion, U.S. Senate Productivity Award, April 1988.

Quality and Productivity Management on Defense Programs, presented at the Institute of Industrial Engineers Aerospace Division Conference, February 1988.

Improving Your Performance Measurement Systems, presented at the Institute of Industrial Engineers Fall Conference, November 1987.

Multi-Factor Productivity Measurement in Manufacturing: A Case Study, presented at the Institute of Industrial Engineers Fall Conference, November 1987.

Development of a Guide to Quality and Productivity Management for U.S. Defense Contractors, presented with Dr. D. Scott Sink at the Institute of Industrial Engineers Fall Conference, November 1987.

Answering Corporate Culture Challenges through Quality and Productivity Management, presented with Dr. D. Scott Sink at the American Gas Association Conference, October 1987.

Quality and Productivity Management, presented with Dr. D. Scott Sink at the Naval Sea Support Center Managers Conference, October 1987.

Performance Measurement and Evaluation: Who for, What for, Tools and Techniques, presented with Dr. D. Scott Sink at the Institute of Industrial Engineers Spring Conference, May 1987.

Gainsharing and Its Role in the Performance Management Process, presented at the Institute of Industrial Engineers Spring Conference, May 1987.

Multi-Factor Productivity Measurement: Research and Future Directions, presented with Mr. Sanchoy Das at the International Conference on Productivity Research, February 1987.

An Update on the Study of Productivity Measurement and Incentive Methodology, presented with Dr. D. Scott Sink at the International Conference on Productivity Research, February 1987.

An Update on the Study of Productivity Measurement and Incentive Methodology, presented with Dr. D. Scott Sink at the Institute of Industrial Engineers Spring Conference, May 1986.

Workshops

Performance Measurement and Evaluation, Imperial Oil, February 1988.

Total Factor Productivity Measurement Model Design and Application, Glaxo Pharmaceuticals, with Mr. Tony Pineda, January 1988.

The Quality of Performance Management Efforts in Industrial Launderers, with Virginia Productivity Center, January 1988.

Strategies for Success through Creative Thinking, Virginia Farm and Industrial Equipment Dealers Association, with Dr. Marvin Agee, November 1987.

Total Quality Management, Fall Manufacturing Conference, National Fruit Product, August 1987.

Total Quality Management: A Day with W. Edwards Deming, Lynchburg College, with Virginia Productivity Center, August 1987.

Quality and Productivity Management Audit, Hubbell Lighting, with Virginia Productivity Center, July 1987.

PROJECT DIRECTION, RESEARCH AND DEVELOPMENT

How A Gainsharing Program Works to Affect Organizational Performance, unfunded, with Virginia Fibre Corporation, March 1991-December 1991.

The Changing Role of the Human Resource Department in the Gas Company of the Future, Bay State Gas Company, co-principal investigator with Dr. Kenneth J. Kiser, \$17,300, December 1989 - June 1990.

Compensation Management in the Utility of the Future, Bay State Gas Company, co-principal investigator with Dr. Kenneth J. Kiser, \$30,649 (+ \$17,000 Virginia Productivity Center cost-sharing) 1989-1990.

Planning for Quality and Productivity Improvement in the Shipyard of the Future, Charleston Naval Shipyard, associate investigator and project manager, \$62,769, May 1989-March 1990.

Linking Organizational Performance Improvement Plans to Employee Involvement, Bay State Gas Company, co-principal investigator with Dr. Kenneth J. Kiser, \$67,500, 1988-1990.

Strategic Performance Improvement Planning Process Research and Development in Support of NOS-Indian Head Planning, Programming, and Budgeting System, Advanced Technology and Naval Ordnance Station, research team member and NOS department facilitator, \$178,006.

Compensation Management in the Organization of the Future, Virginia Productivity Center, associate investigator, 1987-June 1990.

Developing Quality, Productivity, and Shipyard Operations Improvement Strategic Plans, Norfolk Naval Shipyard, associate investigator and project manager, \$102,000, 1987-1989.

Recycling a Strategic Performance Improvement Plan, Naval Sea Center Atlantic (U.S. Navy), principal investigator, \$3,500, May-June 1989.

The Study of Productivity Measurement and Incentive Methodology, DSS-W (DoD) contract #MDA9003-85-C-0237, associate investigator and project manager, 1986-1989.

Soviet Productivity Measurement Methodology, funded as a modification to the above DoD contract, associate investigator, \$95,000, 1987-1988.

Developing and Implementing a Five-Year Strategic Plan for Performance Improvement, Supervisor of Shipbuilding, Conversion and Repair (U.S. Navy), associate investigator and project manager, \$22,000, September 1987.

Developing and Implementing Performance Improvement Plans for Global Operations, Military Traffic Management Command (DoD), associate investigator and project manager, \$25,000, April 1987.

Linking Total Factor Productivity Measurement to Gainsharing, Xaloy, co-principal investigator with Dr. D. Scott Sink, unfunded, 1987.

Development of a Measurement System for Department of Energy's Nuclear Weapons Production Complex, sub-contract through Management Systems Laboratories, associate investigator and project manager, \$15,000, March-August 1986.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

**Institute of Industrial Engineers
Academy of Management
World Future Society**