

AN ABSTRACT OF THE THESIS OF

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Anthony T. Veltri

The purpose of this study was to develop a conceptual framework to enhance the redesign of a safety system. To identify the limitations of the current safety system, the concepts of congruency and integration of the safety function within a specific university environment were examined through a case study methodology. An emphasis was placed on the use of models from business and management literature for both the examination of the concepts and the subsequent development of the conceptual framework for the redesign. The researcher emphasized the use of multiple data sources in this study. These sources included: observations, documents, and interviews. A model from French and Bell (1990) was used to examine congruency which included interviewing two stakeholders associated with executive driven planned organizational change processes as well as the safety manager. A perception survey, as suggested by Petersen (1994), was developed and used as part of the examination of safety system integration and administered to twenty interviewees along with the safety manager.

The findings provided evidence of gaps which may be hindering the success of the safety function within the organization. By examining organizational direction and comparing those findings to the findings representing the direction of the safety function, gaps in congruency were found. Integration gaps were discovered, in part, through examination of the safety process input, as described by the safety manager, as well as the

ABSTRACT (continued)

safety process output as viewed by “customers” of the safety process. Countermeasures to close gaps were discovered in the research and later synthesized into a redesigned conceptual framework. The framework emphasized customer service, a systems approach, and a process perspective as an alternative to the legacy of a traditional, compliance driven safety system found to be in current use.

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**Design for Safety: A Case Study at a University
Examining Congruency and Integration**

by

Rita Finn Sumner

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APPROVED:

Redacted for Privacy

Major Professor, representing Health and Safety Administration

Redacted for Privacy

Chair of Department of Public Health

Redacted for Privacy

Dean of Graduate School

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DESIGN FOR SAFETY: A CASE STUDY AT A UNIVERSITY EXAMINING CONGRUENCY AND INTEGRATION

1. INTRODUCTION

The need for change within an organization can be driven by the identification of gaps in performance, adaptability, and opportunity. A performance gap suggests the need for restructuring dimensions such as quality of service, costs, and administrative systems. An adaptability gap suggests the need for reshaping the dimensions of guiding models, and processes. An opportunity gap suggests the need for revitalizing the dimensions of marketing of services, strategic direction, and efficacy of resources. Improvement in these three areas can produce a value creating environment which is necessary for growth (Boehringer, 1996; Fahey and Randall, 1994). Viewing an organization as a system can facilitate finding gap information. The systems approach suggests that an organization is an open system, an integrated whole, composed of interdependent parts and elements which interact with one another and with their constantly changing environment so that a certain identity is maintained (Dicle, 1969). The safety function can be viewed as an interdependent part or element within an organization in its mission to prepare, preserve, and protect organizational resources from risk, danger and loss (Veltri, 1990; Harrison, 1987). As such, the leadership of that function must create ways to interact with various other elements within that system to minimize gaps and ultimately develop a safety system that creates value for the organization's mission (Creswell, 1987).

The traditional safety management approach that a number of safety managers continue to practice offers an example of a gap in many dimensions (Veltri, 1990). The impetus for this traditional approach is to assure compliance with regulatory requirements. This approach to safety focuses on a crisis management strategy emphasizing short term fixes. This strategy is entrenched in a mentality of deferred intervention, i.e., wait until

there is a loss producing incident, new regulation enacted, or a citation from a regulatory body issued before action is taken. The action that is taken is generally of a controlling nature which may inhibit improvement through enhancing resistance to change (Ansoff and McDonnell, 1990). Additionally, this approach maintains a reactive posture, i.e., protection from an external factor (regulatory compliance) as opposed to a proactive posture, i.e., driven by desire to contribute to the competitive performance of the organization. This model lacks activity in dimensions such as: service quality to customers, use of contemporary guiding management models, and strategic or long term direction.

Various models have been introduced into organizations with the purpose of restructuring, reshaping and revitalizing the organization. Many of these models present application opportunities for the safety function. Several of these models emphasize both a customer service and a process perspective (Peters, 1987; Manganelli and Klein, 1994; Fahey and Randall, 1994). For safety, a customer service perspective would place emphasis on satisfying the internal customer or employee as an antecedent for satisfying the external customer, the end user of services provided by the organization (Grant and Schlesinger, 1995). Pierce (1995) suggests that the definition of customer of the safety function includes management at all levels, other staff functions, and line level employees. A process perspective places emphasis on examination of the interrelationship of providing services and information with the facilitation of receiving these services and information. This process approach allows an end-to-end view of how best to structure, sequence, and measure safety activities to reach targeted outcomes (Davenport, Jarvenpaa, and Beers, 1996). Viewing the management of safety as a process shows the relationship between functions within an organization.

The concepts of both congruency and integration are, also, crucial strategic considerations to the success of any design for safety. The term fit, congruence, or alignment refer to the extent to which the behavioral or organizational requirements and the constraints in one part of a system are compatible with those in another (Harrison, 1987).

The more the tasks, technology, and environments of other units vary from one another, the more the structures become differentiated. Once organizations become differentiated internally, they face serious problems of integration (Lawrence and Lorsch, 1967). In emphasizing both congruency and integration in the design for safety, assessing opportunities for closer linkages with customers is crucial. Deep-seated attitudinal issues that underlie the current state of the safety process must be acknowledged. Stakeholders in the entire safety process must see each other as partners instead of adversaries (Peters, 1987). This emphasis helps shift safety away from a compliance driven model to a more business performance model.

The purpose of this study was to perform an assessment of the safety system at University X (the name has been changed to maintain anonymity). Gaps in various dimensions of the safety system had to be identified. Concurrently, the intent was to move away from any remnants of a traditional model of safety management and toward a model emphasizing customer service, systems view, and process orientation. Gap information was gained through the examination of both the aspects of (1) congruency of the safety function with organizational direction evidenced in the ongoing planned organizational changes, and (2) integration of safety and its processes into the organizational environment. Subsequent to this, a conceptual model to guide the redesign of safety was developed.

1.1 Statement of the Problem and the Subproblem Tasks

The problem involved in this study was to develop a conceptual framework that enhances the redesign of a safety system. The model was applied to a university using a case study method. There were four main subproblem tasks to resolve in this study. The four subproblem tasks were:

1. to understand the strategic direction of planned change at University X and to understand the current design for safety at University X;

2. to understand the knowledge/perception/interaction of safety related activities as viewed by the customers of those processes;
3. to identify gaps in (1) alignment between executive driven organizational changes and the current design for safety and; (2) safety design and activity integration into the organization based on the knowledge/perception/interaction findings;
4. to recommend a design for safety to help minimize gaps and achieve congruency with planned organizational change and integration of the safety design into the organization's overall system.

1.2 Limitations

This study was limited to the assessment and application of models and concepts to an organization undergoing dramatic planned organizational change. Planned organizational change encompasses an executive driven agenda, generally devised for the purpose of improving business performance. The term dramatic is used to represent change that is intended for the whole of an organization and details significant change in how the organizational mission is accomplished.

2. REVIEW OF LITERATURE

As a research strategy, the case study is used in many settings including organizational and management studies. The case study contributes uniquely to the knowledge of an organization through the desire to understand complex social phenomena. It allows an investigation to retain the holistic and meaningful characteristics of real-life events such as organizational and managerial processes. Case study methodology is the preferred methodology when “why” and “how” questions are being posed about a contemporary set of events suggesting that operational links need to be traced. The method is preferred in examining contemporary events, but when the relevant behaviors cannot be manipulated. The case study’s unique strength is its ability to deal with a full variety of evidence, i.e., documents, artifacts, interviews, and observations (Yin, 1985). Case study methodology emphasizes a grounded theory construction. Strauss (1987) describes grounded theory as the discovery of theory from the data through the general method of comparative analysis. Qualitative data is placed into categories and then, through constantly comparing the content of them, defines the properties of the categories until they have taken on an abstract form. These conceptual categories, in turn, are then related to each other according to the discoveries made in the data.

Construct validity, reliability, and external validity are quality of research design tests to integrate into case study methodology. The two case study tactics available for this study to increase construct validity are: (1) using multiple sources of evidence in a manner encouraging convergent lines of inquiry, and (2) having the draft reviewed by key informants. Reliability is the demonstration that the operations of a study can be repeated, with the same results. For this to happen in a case study method, the researcher must document the procedures followed throughout the entire case study process. The test for external validity deals with the problem of knowing whether a case study’s findings are generalizable beyond the immediate case study. Case studies rely on analytical

generalization. In analytical generalization, the investigator is striving to generalize a particular set of results to some broader theory (Yin, 1985).

Three case studies were examined in the development of this research. The criteria for selection were either that safety was a part of the research, and/or a questionnaire was developed by the researcher as part of data gathering, and/or a model was developed based on the research, and an organization was the focus of the study. One study examined changes in a large utility company's health and safety function from a longitudinal, retrospective perspective. In this study, a perception questionnaire was developed and administered (Rose-Hearn, 1991). In "The Transformation to a Learning Organization: A Case Study," Madden (1993) examined the degree of success of an organization attempting to improve its efficacy by aligning the strategy and structure with Senge's The Fifth Discipline (1990). In Madden's research, two questionnaires were developed, one for each of two target groups for data gathering. In Dicle's (1969) dissertation, "Systems Theory and Organizational Change," a thorough literature search was done on the application of "systems thinking" to an organization in the process of change to both create a model to improve performance and test the model within an organization.

There was a paucity of research on safety congruency or integration examination at a university. One author in the safety discipline was found describing strategy, structure, and strategic planning (Veltri, 1990; Veltri, 1991). Pierce (1995) has explored the application of total quality management (TQM) principles to the discipline of safety. Most reference material and related research came from disciplines outside of the safety field. These resources focused on organizational change, reengineering, strategy, structure, congruency, integration, managing resistance to change, organization development, and systems theory from business and management literature.

Several resources were found with an emphasis on systems, process, and customer. In both Manganelli and Klein's (1994), The Reengineering Handbook and Fahey and Randall's (1994) The Portable MBA in Strategy a radical change strategy

utilizing a systems view, a process orientation, and customer service model were emphasized. Davenport, Jarvenpaa, and Beers' (1996) "Improving Knowledge Work Processes" and Dicle's (1969) dissertation entitled "Systems Theory and Organizational Change" provided insightful models for strategy development utilizing a systems view and emphasizing intradepartmental organization. The discipline of organization development was explored through the work of Beckhard and Harris (1987) in Organizational Transitions: Managing Complex Change and French and Bell (1990) in Organization Development: Behavioral Science Interventions For Organization Improvement. These resources offered useful models to facilitate examination of various aspects of organizations and for devising methods for improving effectiveness.

2.1 The Examination of Safety Congruency

For an element of an organizational system to contribute to the business performance standards of an organization, familiarity with the overall corporate and strategic intention is imperative. This is a part of viewing the organization as an interrelated system as suggested by Dicle (1969). When changes are taking place within an organization, the safety leadership must evaluate the changes and new direction of the organization to look for gaps by comparing the direction of the safety function with that of the organization. This suggests examining the dynamics of organizational change, the expected impact on the direction of the organization, and the subsequent formulation of a new design for safety to minimize congruency gaps.

Examining details of organizational processes can provide insight into what is going on and how it is being accomplished. Understanding these details in an organizational system can identify the need for change in the resident safety function to improve congruency within the organization. The processes described in the French and Bell (1990) model are central to effective organizational functioning, are of a ubiquitous nature in organizations, and are frequently focal points for problems. Understanding these processes

and their expected outcomes offers a glimpse into the dynamic operating systems of a facility and can be an important source of information that could assist in improving how the safety function fits into the organization.

There are eight organizational processes described in the French and Bell (1990) model. They are:

1. communication patterns, styles, and flows to provide insight into how a process has been manifest;
2. goal setting or setting task objectives and determining criteria to measure the accomplishment of objectives which includes development of a mission statement;
3. decision making, problem solving, and action planning activities and the outcome for those affected;
4. management of conflict resolution to include interpersonal and intergroup situations;
5. managing interface relations both within a process and between stakeholders and other groups;
6. supervisor and staff relations and examination of the extant leadership styles;
7. technology and engineering systems examination including: information systems, policies, procedures, and technological systems;
8. strategic management which includes strategic planning, strategy implementation, and the long term viability of the organization to remain competitive and effective.

2.2 The Examination of Safety Integration

Fahey and Randall (1994) suggest that managing internal integration across the organization can have a dramatic effect on success. This suggests that managing the integration of safety can profoundly impact organizational success. It has been demonstrated that a gap in most safety programs is the lack of knowledge of how people perceive and react to safety requirements. This lack of understanding may have resulted in programs that have focused on attempts to “engineer” solutions to what were actually symptoms of behavioral and management system problems (Bailey, 1993). This lack of

understanding about the performance and outcome of safety policy and procedures suggests that the safety leadership lacks a grasp of the needs and desires of its customers. Additionally, organizational barriers to safety integration need to be discovered and eliminated. In order to facilitate improvement an evaluation process is needed. Petersen (1994) suggests the use of perception surveys to measure effectiveness and identify weaknesses of safety programs. This can be augmented by other data collection methods to facilitate barrier discovery.

2.3 Designing the Future State of Safety

Several models exhibited desirable characteristics for consideration in the redesign process. Reengineering is the “fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service, and speed” (Champy, 1995). Applying this to safety requires a reassessment of potentially obsolete rules and assumptions that govern the way safety is managed. Boehringer (1996) has developed a process model called a “state change chart,” in augmentation of the reengineering process, to use in development of a process vision. It allows the user to list the “ideal” as an output of a system so that the user can develop the input list to close the gap as a practical way of reaching the output or desired state. Manganelli and Klein (1994) have developed a five stage process for using reengineering methodology to facilitate change. These are similar to Fahey and Randall’s (1994) reconfiguring operational processes in strategic change. The five stages are:

1. the preparation stage is designed to produce a mandate for change by mobilizing organizing, and energizing the people who will perform the reengineering;
2. the identification stage emphasizes understanding a customer oriented process;
3. the vision stage is the development of a process vision capable of achieving breakthrough performance;
4. the technical and social design stage specifies the description of technology, standards, procedures, and systems for the managed change and

concurrently specifies the description of the social elements and their development for an effective interface with the technical changes;

5. the transformation stage includes development of both the pilot and full production versions of the reengineered process(es) and the continuous change mechanism.

Davenport et al. (1996) defines the knowledge or information worker's primary activity as the acquisition, creation, packaging, or application of knowledge or information. The most effective course in managing knowledge or information workers is using a participative model. This is somewhat of a departure from strict reengineering methodology which requires a strategy for achievement of commitment through mandate (Champy, 1995). Katzenbach and Smith (1993) suggest that teams outperform individuals acting alone or in larger organizational groupings, especially when performance requires multiple skills, judgments, and experiences.

Dicle (1969) suggests emphasizing three areas in a change process. They are: those related to human elements; those related to structural elements; and those related to technological elements of the organization.

The human elements are:

- improving individual interpersonal capacity
- improving individual skills and relevant organizational knowledge
- development of mutual trust and personal commitment
- effecting value change through openness and collaboration (consensus)
- improving intragroup and intergroup understanding

The structural elements are:

- maximizing participation in organizational decision-making
- maximizing free and open communication
- minimizing the hierarchy of authority
- minimizing all other rigid hierarchical structures organization-wide

The technological elements are:

application of systems theory to organizational study

adoption of integrated information systems

Utilizing these objectives can maximize flexibility and adaptation for assurance of congruency and integration of a function into a complex and dynamic environment.

The available literature provides concepts and models to facilitate incremental examination of the problem and completion of the subproblem tasks. However, this study in total exhibits a comprehensive application of ideas across multiple disciplines to examine congruency and integration of safety in a specific, dynamic environment using a uniquely designed case study methodology. The development of a subsequent conceptual framework for the design of safety provides a creative contribution to the discipline of safety management by offering a sound alternative view to the safety model in use at University X.

3. METHODS AND PROCEDURES

This chapter is divided into three sections. The first section discusses the case study method selected for the study. The second section provides a discussion about data collection, tools developed and used for this study, and details the treatment and analysis of data. The final section presents the criteria underlying the selection of the organization for investigation, and briefly describes the facility chosen.

3.1 Selection of Case Study Methodology

In this study, the researcher originally phrased two research questions, how can a safety system be evaluated at University X; and based on the findings, how can an alternative model be developed at University X? These original questions prompted the researcher to seek a research method to pursue the questions. Subsequent to posing these questions and following a preliminary literature review combined with the researcher's observations, the next two questions to emerge were: (1) how well does the safety function fit into the existing organization in light of the executive driven organizational changes; and (2) how is the safety function viewed by stakeholders (customers) both internal and external to University X? Reflecting on the original questions, it was evident to the researcher that Yin's (1985) three criteria for determining the appropriate use of a case study methodology were met. The three criteria are (1) the presence of a "why" or "how" question(s), (2) the lack of control the investigator would have over actual behavioral events, and (3) the complete focus the questions suggest regarding contemporary events in the organization of interest.

In this study, the researcher desired to perform an in-depth and intense examination of an organizational element, the safety function, in a larger system undergoing planned organizational change. The case study methodology and subsequent qualitative handling of data allowed the researcher to bring to light important variables,

processes, and interactions with the ultimate goal of recommending a conceptual framework for a redesign for safety.

Research design tests to strengthen the quality of the research design were emphasized throughout the entire process of data collection and analysis. Reliability was emphasized in the constant use of “memos” (Appendices E and I), and field notes collected on field data from observations, documents, and interviews. The compilation of this data provides an historical data archive from which a methodological reconstruction could be done. Construct validity was emphasized through the use of multiple sources of data, including: observations, documents, and interviews.

3.2 Data Collection and Analysis

Since a case study can involve a large amount of various sources of data and documentation, a systematic plan for data collection is imperative. A protocol was developed which included the following: project objectives, field procedures to collect documents, observations, and interviews, and the development of the case study questions. Since connections among data elements were sought, “memoing” aided the constant search for configurations in the data that suggested that certain pieces of data belong together. These emerging analytic notions help to identify emergent themes, patterns, or explanations and generated ideas for further data collection (Tesch, 1990). The field procedures guiding data collection included items such as: planning access to key interviewees, documents, and observations; planning resources to take to each data collection event; creating a clear schedule of data collecting activities; and providing for unanticipated events. The field data collected included: observations, documents, and interviews. Observations emphasized interaction processes such as: various meetings regarding safety or a change process; and safety staff interaction with the university community, regulators, and unions. Additionally, observations preceded interviews so that the questions could be better framed, and so that the interviewer could have a better grasp of what information was

relevant before initiating questions (Yin, 1985). Document collection emphasized information regarding the three organizational change processes, safety function operation, and formal and informal committee minutes and reports related to safety processes. Collection of interview data was the most challenging aspect. Data collection instruments had to be developed.

In examining congruency, questions from French and Bell (1990) were adapted to probe for information from both the safety manager about safety processes and two interviewees intimate with each of the three planned organizational change processes. The two interviewees were selected from their association with each change process as evidenced from documents for each of the planned change events. A two column format was used with each process which included prompting questions as listed on the left hand side and a space for field notes on the right hand side (Appendix A). The data statements were constructed into a matrix (Appendix B) with the eight organizational processes across the x axis and the safety manager response and the three organizational change process elements along the y axis to facilitate comparison of process elements. Some examples of constructed statements placed into the matrix from the safety manager and communications intersection statements included: safety manager to staff - communication is mostly informal verbal interchange; selected information is shared with staff; staff meetings emphasize reporting of issues in individual staff areas; safety manager prefers staff communicate with organization by written, electronic, and verbal means, in order of preference; and safety manager sees the role of the safety function as information source.

The treatment and analysis of data for the study of congruency were intricately linked from the beginning of data collection. Newly gathered data were continuously compared with prior information in order to identify any new direction for investigation. The researcher used the boxes of the matrix (Appendix B) to code and log the collected data from interviews, field notes from observations, and information from written documents into the eight processes used as core categories. This format offered a way to compare and

identify aspects of processes where opportunities for congruency may be found for a better alignment of the management of safety with the organizational direction. The gaps were identified and alternate safety strategies were subsequently developed. Additionally, lists of goals were compiled from the data for each of the three planned organizational change events (Appendix D) for further insight into the organizational direction as designed and championed by top administrators to guide organizational change processes.

To examine the integration of the safety process an instrument utilizing broad-based, open-ended questions was presented to individual stakeholders (Appendix C). Questions were derived by the researcher with customer service, process orientation, and systems view of the organization in mind (Manganelli and Klein, 1994; Fahey and Randall, 1994; Dicle, 1969). The interviews were taped and transcribed. Although taping can make interviewees hesitant to expound on issues. Since the study was in-depth and exploratory, it was important to capture the entire content in precisely the context it was intended. Taping allowed the researcher to focus on the direction and flow of the interview rather than on note-taking (Strauss and Corbin, 1990).

In addition to the safety manager, twenty other interviewees were selected. From observations, the organizational chart, and documents from various safety committees, interviewees were selected. These included: chairpersons and other safety committee members past and present, task force members for particular safety issues, occupational health nursing staff, hospital quality management, managers at various levels, line-level employees, human resources, and union representatives. The twenty interviewees and the safety manager were asked varied questions on perception, knowledge, and interaction with the safety function and safety processes. The responses to those questions were critical to the analysis of aspects of understanding the current state of safety integration across the organization. Inclusion of the safety manager allowed viewing the input to the safety process. The safety process output could be viewed from the customer perspective. Integration gaps were identified and strategies for closing the gaps were

developed. The three subsets of the core category of integration which evolved during data collection were:

1. safety communication
2. safety management
3. safety process

The findings from the data for each of the three subcategories were expanded upon by the researcher using a “state change chart” (Boehringer, 1996). This allowed the findings to be seen as the desired state to achieve or the output in a process. The researcher then developed the input side of the process to list the strategies necessary to achieve the desired state and close the gap. These charts were not crucial to the analysis but added flexibility in conceptualizing the vision for the final model (Appendices F, G, and H).

Interviews were arranged through either e-mail or telephone. The researcher introduced herself, identified her employment position, and requested an opportunity for a face to face interview. She also stated that this interview was part of a thesis requirement for her graduate program. Response was generally positive. Of the twenty-two people (in addition to the safety manager) interviewed, two people requested additional information before a positive response was received. One person requested to see the questions prior to meeting. Each interview was done independently and face to face. Sufficient opportunity was made available to interviewees to initiate other areas of discussion which they felt were important (Strauss and Corbin, 1990). The interview format was altered to allow for the assessment of the newly surfacing ideas throughout each interview process. At the completion of each interview an assessment was made to determine if additional people should be interviewed in light of any new information obtained. This technique of “theoretical sampling” is necessary for qualitative research in which attempts are being made to establish theory or, as in this case, to further develop existing concepts (Strauss and Corbin, 1990). Following the draft process, interviewees were given a copy of

statements and the context of those statements made to provide feedback of accuracy of the information to strengthen the construct validity.

Coding of data was performed line by line usually in the margin of the transcribed field notes or documents. Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. As Strauss and Corbin (1990) suggest, data was reviewed for “empirical indicators” consisting of behavioral actions and events, observed and described in documents and in the words of interviewees. The result was a cumulative knowledge about relationships between data, categories, and subcategories.

Field notes relevant to each observation, document review, and interview were written immediately following the event. Field notes linked the most recent information with previously collected data, and raised questions for subsequent data collection which ultimately led to clarification and depth of understanding of both direction of the organization based on its change processes and the current organizational perceptions of the safety management system (Strauss and Corbin, 1990). The field notes were instrumental in allowing a continual interplay between data collection, analysis, reflections on the guiding framework, evolving understanding, and gap identification.

The research question was made clear prior to the collection of data. The categories of congruency and integration were seen as critical elements to examine the current safety system and believed to be potentially important for the redesign of safety to improve the efficacy of safety processes at University X. Because these constructs proved important as data collection progressed, they were maintained throughout the study as the focus of data collection and analysis.

3.3 Selection of the Organization for Investigation

Given the objectives of this study, the complex facility of higher education selected for investigation needed to meet two criteria. First, it was important that the organization

selected was in the process of dramatic organizational change. Second, it was important that a formal safety function be present. University X met each of these criteria. Knowledge of this facility and access to various stakeholders was facilitated by the researcher's familiarity with the organization. Organizational change over the past several years has been substantial.

Three planned change events have either occurred or are occurring at University X. They are: (1) labor management cooperation, (2) shift to a public corporation model, and (3) hospital/clinic restructuring. In early 1992, the first stakeholder orientation was held to familiarize labor and management about the process called Labor-Management Cooperation, a quality of worklife program which was devised to shift labor and management interactions from an adversarial nature to an organizational climate utilizing empowerment, group problem-solving and consensus-building. In 1995 University X transitioned from a facility of the state system of higher education to a public corporation. This enabled the institution to stand alone in terms of a financial and administrative structure. Hospital/Clinic reorganization/operations restructuring began in 1993. Activities centered on streamlining processes, cost-cutting, decentralization, information system upgrade, and service performance improvement. Collectively these improvements were designed to increase the competitive advantage of healthcare delivery and streamline the administration of the university and move University X toward a "world class" status.

The safety manager, who has been in that position since 1983, is responsible for programs including: industrial hygiene, hazardous waste, asbestos, training, regulatory compliance, environmental health, and fire safety. On staff are five full time safety personnel and one half time support person. Until 1985 the safety manager was also responsible for worker's compensation. In 1985, a Workers Compensation Coordinator position was created and positioned in a different part of the organization. In 1995, a Risk Manager position was created in response to the change to a public corporation. This position would maintain the responsibility of managing insurance and liability issues related

to the operation of this facility. Radiation Safety falls under a lateral management position and is outside the scope of this paper.

4. RESULTS

This chapter presents the findings regarding the current state of congruency and integration of the safety function within University X.

4.1 Congruency Findings

In examining and comparing the eight organizational processes with the safety management process, gaps were discovered in each of the eight process categories. Highlighted areas from the organizational change processes were seen as opportunities in understanding the direction of the organization. The findings were:

1. In the communication process, the two major gaps discovered were: (1) the dominant communication strategy is compliance driven interdepartmentally, and (2) the intradepartmental communication is highly compartmentalized. From the planned change events it was evident that a communication network was planned early in each of the three processes, and group decision-making and consensus-building were emphasized;
2. In the goal setting process, the major gap discovered was that planning has not been a part of the safety function strategy. In the organizational change processes planning was emphasized, mission statements were prepared, and goals were developed;
3. Decision making has been accomplished from a hierarchical approach within the safety function. There has not been a focus on developing an approach to problem-solving. Emphasis has been on technical safety issues. The organization is incrementally shifting away from a command and control system toward other more participative management styles including self-directed work teams;
4. The use of a process to address the resolution of conflict has not been addressed within the safety function. Outside consultants have been used in the organizational change processes to break through barriers during various phases of the change process;
5. The gap in the management of the relationship of the safety function staff among members is that barriers that exist have not been addressed and the effective working relationships have not been enhanced. The gap identified in the safety staff relationship with those external to the safety function suggests that the interface is frequently inconsistent, externally compliance driven, and communication effectiveness is limited. The change processes utilized a consensus-building team structure;

6. The gap in supervisor and staff relations within the safety function rests on the maintenance of a command and control system of management. The organizational change processes emphasize non-adversarial collaboration between management and non-management factions to improve change effort effectiveness;
7. The main gaps in the technological and engineering systems are weaknesses in the maintenance of information within the safety department, availability of information to external users or customers, and the coordination and synthesis of other sources of risk, danger, and loss information and data both internal and external to the organization;
8. Two of the organizational change processes included strategic planning in the process. One of these change processes advocates strategic planning at the departmental level. The gap within the safety function is a lack of competency development of the safety leadership in strategic planning methods.

4.2 Integration Findings

The combination of a perception survey, documents, and observations provided insights into gaps to close for improving integration of safety processes. This data was coded into three areas: (1) communication, (2) safety management, and (3) safety processes.

For the survey twenty interviews, in addition to the safety manager, were completed regarding the perception of, knowledge of, and interaction with safety processes across the entire University X. The survey began with questions regarding length of employment and historical description of the interviewee's role(s) within the organization. The length of employment ranged from less than one year to thirty-eight years. The various roles were selected to capture the broadest and most representative departments and levels in the organization. The remaining questions focused on gaining insights into the integrative aspects of safety. The findings for each of the three subcategories were as follows:

4.2.1 Safety Communication

Several interviewees specifically cited that communication needed improvement along with some aspect of the safety management process. Examining responses, one safety function staff interviewee stated, "I still see the environmental health and safety function largely being compliance driven, responding to and in situations that arise, not very proactive, however, the staff make a difference. In general it is pretty much responding to fires" (Interview, February 9, 1996).

As evidenced here, the guiding strategy/model of the safety function is compliance driven. As observed there are philosophical differences within the department and other independent, unorchestrated strategy options are occasionally explored; however, intradepartmental communications are hindered because of a lack of guidance in problem-solving past the barriers of these differences that have developed.

The same safety function staff member commented on communication with groups external to the safety function when asked a question regarding the value of customer service:

... I don't think we know much about our customers. When you are in a compliance driven environment...we are only paying attention to those needs that are indicated for us by directives, guidelines... To my knowledge we do not have much in the way of feedback to find out what our customers think about our function. My impression is that they have had little contact with us...(Interview, February 9, 1996).

This perception regarding limited customer (employee) knowledge was supported by five other interviewees including managers from human resources, hospital quality management, employee health, and medical research who stated that they viewed the environmental health and safety department as not very visible in the organization. Without interaction or visibility, the researcher concludes that ongoing safety processes are meeting with and will continue to meet with limited success.

There is acknowledgment at the administrative level that communication enhancement is necessary for effective operation as a university administrator stated:

I don't think there can ever be enough communication through enough multiple channels of the same information, and by example I think that there have been improvements made in timeliness, and the openness of issues...with the e-mail facility and the voice mail facility to just update people about issues and allowing people to apply them maybe to their own specific setting. But I'd like to take it a little further. I could see a very active website for safety...I think that people are getting so overburdened...so tethered to their workstations that that is the most easy facility for them to access... That is the next step... almost like a daily message about what is going on in health and safety generally and maybe an opportunity to interact on some specific Q and A's on the workplace (Interview, May 5, 1996).

Environmental Health and Safety has a website under construction, which has limitations for access. The administrator, in the above, is expressing a need for dynamic interaction as a customer in the safety process. The strategy of safety communication selected for use with the university populations it services can be crucial to success. With unmanaged communication understanding and productivity will be adversely affected. Persons who do not have a thorough understanding of the benefit to them of a change in the safety process are more likely to create a resistance to that change (Manganelli and Klein, 1994).

More fully developing the safety communication strategy would facilitate the use of a more proactive supervisory and managerial approach to safety. The occupational health nurse responded to a question regarding supportiveness of safety and health related issues when she said, "Most of the managers and supervisors have the employees' best interest at heart but they don't know or understand why something [a safety issue] is important and that such a program exists" (Interview, March 4, 1996). A former safety committee member responded, "A lot of it has to do with educating the supervisors to recognize what is good behavior and what is bad behavior, and then having them correct the employees' behavior. That is probably one of the biggest problems: just ignorance" (Interview, March 20, 1996). The former safety committee interviewee noted that she has encountered varying levels of assistance from the individual safety staff. The researcher suspects the underlying cause is a lack of consistent strategy within the environmental health and safety department.

In a labor union agreement in 1992, the labor contract bargaining committee developed a structure of safety teams representing geographic areas of the university to help facilitate two way communication for safety, health, and environmental issues in their areas. Although the structure was designed under the duress of the bargaining process, the outcome has been unremarkable and somewhat awkward. The structure was developed before a strategy for achieving yet to be specified goals. Whereas structure should be driven by strategy (Veltri, 1990; Peters, 1987). Now, goals are nebulous, achievements are minimal, and frustration is evident on the part of the safety team members. When asked about the effectiveness of the safety team process one safety team member responded:

I don't see how you can do a job when you are so geographically separated as the areas that I have. The off campus location does not even know I am one [a safety team member representing their specific off campus locations] unless they have seen something printed. Initially, when I started, I was going to send a letter to everyone introducing myself, but I never got a list [of employees in my area]. I asked two or three times...so I never sent a letter. I don't feel that it is very effective right now. We didn't get enough training. I think a lot of us don't know what is expected of us. I know the labor/management safety committee has talked a lot about our training, but they really drag their feet, mostly talk about it rather than act on it... Definitely [we need] more training and they [labor-management safety committee] need to quit stalling...and make a decision and do something about it now. Definitely more communication. Maybe an occasional update meeting or informational meetings so that there is an opportunity to ask questions. So that the safety team member is not just a title but that we are here for a reason (Interview, March 23, 1996).

Another safety team member has described similar communication weaknesses when asked to describe the effectiveness of the safety team process, "Whether this is because of my own not going out and seeking out information about what the safety team is supposed to do or... because they have not really come to me... I'm at a complete loss for what the safety team is supposed to do" (Interview, April 1, 1996).

From the research laboratory environment, one interviewee provided a comment which strengthened the emphasis on customer need in safety and downplayed the regulatory aspect when she said, "Most people don't know anybody in environmental health and safety, so I think that if there was more involvement with the labs, not so much

on a regulatory basis...but as actual consultants or advisors..." (Interview, April 25, 1996).

The workers compensation coordinator suggested that the method of getting information back to the line level employee needed improvement. In response to the interview question regarding the customer oriented aspect of the current safety process the interviewee responded:

I could say that I see that there are areas that could be improved in terms of the communication...the situation[s] that I am thinking about are when an employee has a concern and testing is done and that information is not communicated back to the employee[s] so they are upset and think no one cares, when in fact it has all been done. It is just somewhere and I guess maybe the supervisor or somewhere in that process the employee is the last to know (Interview, February 8, 1996).

The risk manager interviewee made a comment related to his vision of the role of risk management in University X's safety processes. This comment suggests the need to assign accountability for losses to areas where losses are occurring, and an enhanced relationship between risk management and the safety function. The researcher interprets this as an emphasis on providing cost feedback to managers on losses and a need for emphasizing a creative relationship between safety and risk management.

I believe that a good risk management program can facilitate that process [safety process] by properly allocating the costs of accidental loss and being able to quantify that loss in very specific terms of the cause and effect of not embracing the mission of the safety function. So I think that is going to be one of our primary challenges: to be able to communicate to people exactly what the cost and effect is of decisions they make on the operations side. And I think if we can do that I think it has been shown over and over again that if the risk management program can do that then you can have a real impact on the safety in the workplace and for the patients and visitors (Interview, February 10, 1996).

4.2.2 Safety Management

Management system development addresses alternative philosophical approaches to the safety management of University X. The safety management system is the driver of the safety process. There is both a local and a global dimension to it. The local dimension describes the management of the safety function and its internal processes. The global dimension describes the safety management development of managers at all levels outside of the safety function.

The administrator over the safety function, the assistant CFO, offers a “giraffe award” to those who will stick their neck out and try something new. He stated, “I encourage people to step outside the box; then change can happen. There is enough evidence that when people use creativity it increases fulfillment; it increases constructive contribution, and increases cost savings as a result” (Interview, May 5, 1996). This perspective suggests one level for sponsorship for the safety system change model use at University X. Administrative sponsorship is essential for the success of a safety process change (Manganelli and Klein, 1994).

The risk manager who has been at the facility for less than one year commented about the effectiveness of the current safety process. His comments suggest the inadequacies of using standard risk management statistics in planning for safety.

My perception is based on what I’ve seen of our historical loss experience in terms of where we are having injuries and accidents and property damage. In comparing what has happened historically we have a very good loss record. We spend less on average than other health care institutions... (Interview, February 10, 1996).

Subsequent to this, when asked about important safety issues faced by this institution the risk manager replied, “We have many more workplace injuries than we should have... From a cost standpoint the cost of paying for work related injuries is the largest piece of our total pie and so it deserves the most attention...” (Interview, February 10, 1996). Regarding improvements that could be made to the safety management process,

the risk manager stated, "On the occupational safety side the number of work related injuries is on the increase...I think the challenge is to create an environment that is more proactive..." (Interview, February 10, 1996).

This portrays a system using a basic and limited risk management type output to assess the whole of a complex system. Further observation of increasing losses indicated some dysfunction within the current system. The flaw with the risk management indicators is that the trends only capture a small aspect (part of the direct costs) of losses and lacks a comprehensive view.

When asked about the effectiveness of the safety management system the workers' compensation coordinator replied:

...we do not do a lot of proactive stuff, in terms of personnel and staffing. As in most places, a lot of it is responding to problems...It would be nice to have some sort of overall plan. To work toward and encourage some sort of proactive activities that would fit into that plan that would hopefully reduce the work you are doing at the tail end (Interview, February 8, 1996).

The term proactive management, as defined by F. David Pierce (1995), is a method of management where daily activities are the result of a planned course of action. The use of planning does not appear to be a priority within the safety system at University X. A hospital administrator responded to a question regarding the idealness of a compliance driven system as used at this facility. He said, "I don't think the ideal will happen unless there is some incentive causing it to happen."

As described in chapter one, a reactive system is not a successful system of management. The legacy system of safety management at this university is a reaction driven management system. This is exemplified in a statement by the Occupational Health Nurse, "... a lot of what this institution does in terms of health and safety of its employees regardless of which department ... is that we put out fires. We don't have a really good comprehensive preventative program in anything." Further evidence of a compliance driven system came from the safety manager when he stated, "...take for instance Sterile Supply when the ethylene oxide rules came down. Then the safety function and the code

compliance function did provide an element of safety from exposure of ethylene oxide from... [those] employees...This statement emphasizes the state of the safety function, that is, it does not provide safety until it is required to do so.

4.2.3 Safety Process

Safety processes are systems, that is, combinations of functions. Safety processes are the complex and continuously evolving interactions of vertically and horizontally integrated functions within a system that accept ownership and move proactively toward quality improvement. Emphasizing the process, shifts the accountability system from a staff safety responsibility without authority to a line responsibility with authority. This minimizes externally driven conformance initiated by the safety function and directed to other functions. It is a shift away from a system emphasizing conformance to regulations and toward a system of performance that adds value to the organization.

Moving away from a functional to a cross-functional approach of operating and problem-solving has been identified as an effective and efficient method to both improve processes and customer satisfaction (DeRose, 1994). The occupational health nurse identified barriers to efficacy of that operation:

My responsibility for employees is on an individual basis... fragmentation...infection control is responsible for the exposure incident, and I am responsible for the exposed employee...they track if multitudes of people were exposed to something. I might never know it except that I'd notice that we had more than one employee [exposed]. I also serve on the hospital safety committee; so I hear something that disturbs me at a committee meeting...things that concern me and I get involved...because I'm interested in it not because there is any organized drive to get things accomplished (Interview, March 4, 1996).

This demonstrates that at University X the many functions which facilitate assessing risk and preventing losses are not orchestrated and are problematic because of a high degree of differentiation (Lawrence and Lorsch, 1967). This is contrary to viewing University X as a system of interactive and connected elements (Dicle, 1969). Currently, the employee health

function services only the hospital and clinic employee populations. The university side of the organization is excluded from utilizing the service without being charged for the service. This structure causes a probable under-utilization of the service on the university (non hospital) side because of the potential impact to the budget of either the schools or research grants. This limits the identification in areas of risk, danger, and loss.

The safety director of the university does not consider all aspects of risk, danger, and loss potentials to the university important. A hospital administrator states, "...I don't see disaster planning where I think it should be. There is pretty good cooperation from the safety end between the hospital and the safety group for the university. But on disaster [planning] the hospital is alone" (Interview, February 16, 1996).

An observation was captured during an interview with a safety staff person. The comment supports the need for an emphasis on cross-functional efforts.

Incident follow-up and investigation has a lot of holes in it.
There is a weak link in communication between the workers' compensation function and the safety function and...risk manager...
I think those are three entities that need to integrate so well that they function seamlessly (Interview, February 9, 1996).

The workers' compensation coordinator commented when asked about her perception of the effectiveness of working relationships between workers' compensation, safety, and risk management. This is an example of the barriers created in a highly differentiated organization (Lawrence and Lorsch, 1967).

I think that we have all the resources here. I don't think that we work as a group well. I don't think its because we don't want to; its just that we haven't. I think part of it is because we are sectioned off in groups. For example, the hospital is the hospital and we are not and there are different groups. The hospital works different[ly] from central administration. I think that is one big problem, and also we have all different groups who try to communicate, but I don't think we've been real successful... And I don't think we've gotten together and worked on a solution together (Interview, February 8, 1996).

The infection control coordinator who is active only on the hospital/clinic side of the university has relayed her observations regarding where accountability should lie for health and safety:

...I think it should be coordinated in one place and not split up. I think that should be dictated from the CEO down...
 ...I think the scope is too great probably for one department. It needs to have at least a two or three person taskforce that jointly give direction and helps develop the goals and objectives for the health and safety programs for the entire hospital and clinic system...I had made an appointment with the assistant director of [one of the research groups] who was over that committee [biosafety committee] and who wanted to take the whole issue of the exposure control plan for blood and body fluids to the university level so that the school of medicine, school of nursing, school of dentistry, hospital and clinics so that we are all doing the same thing because we share employees and students and it is very confusing to go from one part of this campus to the other and have different rules apply (Interview, February 20, 1996).

This indicates some of the degree of functional isolation that exists in the various groups on campus and the need for an organized effort to break down barriers to improve the safety processes and a partnering of efforts.

The infection control coordinator added:

...Everybody is kind of out doing their own thing and nobody is really coordinating it. It [the safety process] is not a really well understood process and again I think that is in part on the hospital and clinics side. They don't or haven't seen or are only beginning to see environmental health and safety as a resource (Interview, February 20, 1996).

The interview responses have provided clues of the ripe opportunity for development of safety processes across functional lines, to facilitate horizontal and vertical integration (DeRose, 1994).

The labor/management safety committee has been a legacy of non-direction.

When asked about her perception of the role of the committee, the workers' compensation coordinator responded:

We've been struggling with that. I think it has definitely improved. Right now it serves as a way for people to voice their concerns and the minutes are read by everyone so it is a way to make sure that more people know about these things. Hopefully, in the future there will be a way to do some proactive kinds of programs perhaps...
 ...I think we need to figure out exactly what it is we want to do... there is no accountability on the committee no one really has to do anything...we need to find some things for everyone to do...sort of assign some tasks and I think people would be

more interested in attending because it gives them something to do instead of sitting around for an hour (Interview, February 8, 1996).

The hospital administrator recommended these improvements to the labor/management safety committee:

I think that when a safety issue is identified it takes so long to get it resolved. The solution may be easy but it is the jumping through the other hoops to get through our process...to actually get the problem solved... There might be a safety budget or something that would allow [the labor/management safety committee] to obtain funds to take care of the safety hazard...It could be monitored at the administrative level (Interview, February 16, 1996).

When asked about the effectiveness of the current safety process one administrator's response suggested an approach beyond the compliance model. He said:

...the combined efforts of labor and management to basically work toward safety oriented solutions in a non-confrontational, non-blaming process has been very successful...I think protection is more applicable in terms of what I think our program [safety] ought to be about. And that might go far beyond what I think minimal regulatory compliance is. Philosophically that is what we ought to be doing and if we can focus that way, we won't just do ... the minimal because we have to, but do...from a protective standpoint because we ought to do. I think this will give us a business advantage (Interview, May 5, 1996).

In summary, gaps have been identified through collecting data from interviews, observations, and documents. This examination has provided an in-depth view of the current design of the safety function and associated processes at University X.

5. RECOMMENDATIONS

This section provides a summary of the recommendations which evolved from this study. The recommendations include strategies for gap closure from both congruency and integration findings. The final recommendation unfolds a systematic conceptual design model for safety at University X. Concluding this section are analytical generalizations that the researcher has drawn from this study.

5.1 Congruency Recommendations

The congruency findings provided a challenge for both developing strategies to counteract the gaps that were identified and realigning the direction of the safety function with that of the organization. The following are recommendations for each of the eight organizational processes examined:

1. To move the alignment of the safety function closer to the direction of the organization, a shared, open communication process, minimizing compartmentalization and maximizing intradepartmental communication and information sharing combined with an emphasis on contribution to the success of the organization would enhance the fit of the safety function within the University X environment;
2. To align the management of safety with current management philosophy and strategies used in change processes, the use of planning would facilitate a movement of safety toward a more proactive approach;
3. To better align the safety function, a more participative approach toward decision-making intradepartmentally and investment in elevating the competency of the safety staff in the standard problem solving process through the use of an available in-house team would improve effectiveness;
4. To better align the safety function within the organization, the investment in the safety staff to develop competency in conflict resolution would enhance the interface effectiveness of the safety function staff both internally and externally. Internal consultants are available to enhance this process;
5. The use of a team model within the safety function could enhance relationships both internal and external as well as improve individual effectiveness;
6. Shifting the leadership of the safety function toward a facilitator role in the development of a team process, as stated in number five, could eliminate the

internal adversarial relationships currently present and move toward better congruency with organizational direction;

7. An information system upgrade to better serve customers was a vital part of one of the organizational change processes. Placing an emphasis on development of a system of information acquisition, maintenance, synthesis, and availability could enhance safety function operation, and safety decision enablement both inside and outside of the safety function;
8. Competency development of the safety function leadership to include aspects of strategic management in its overall plan would enhance a shift from an external compliance driven model toward an internally driven performance model.

5.2 Integration Recommendations

The integration findings provided a challenge for developing countermeasures for the gaps that were identified. The following are the strategies developed in each of the three integration categories:

1. Activities identified to close the safety communication gaps were: enhanced communication among safety function staff, enhanced communication between the safety manager and the safety staff, enhanced communication of both the safety manager and the safety staff with outside departments, effective marketing of the safety function as a resource, defining the role of the safety function in the communication process, and communication strategy based on non regulatory issues. These recommendations have been reconstructed into the output of a "state change" model (Appendix F) described in Boehringer (1996);
2. Activities identified to close the safety management gaps were: the use of planning to improve the efficacy of the safety function, moving from a reactive to a proactive approach to safety, manager education in safety decision-making, gaining upper level administrative support, safety staff development, and developing strategic indicators of success. These recommendations have been reconstructed into the output of a "state change" model (Appendix G) described in Boehringer (1996);
3. Activities identified for closing the safety process gaps were: capturing cross-functional opportunities, developing an improved way to accumulate, assimilate, and disseminate resource information, and leadership development in the overall safety process. These recommendations have been reconstructed into the output of a "state change" model (Appendix H) described in Boehringer (1996).

5.3 Recommendation for the Design for Safety

In moving toward model development, the researcher has drawn clusters of information from the research data. The three critical areas of distilled improvement areas that have been identified are:

1. congruency recommendations (Section 5.1)
2. integration recommendations (Section 5.2)
3. list of goals of planned organizational change (Appendix D)

The opportunities identified from these three critical areas will be further distilled, synthesized, and integrated into developing a safety design model. The intent of the model is to maximize the congruency of the safety function and processes within a dynamic organizational environment and to optimize its integration both vertically and horizontally into a complex and highly differentiated organization.

The guiding models for the selected change methodology is the Manganelli and Klein (1994) model, the Fahey and Randall (1994) model, and the Dicle (1969) model. In the researcher's model, safety core process change employs a three stage methodology that enables the safety leadership to redirect safety by making radical changes in strategic and value-added safety processes. Dicle (1969) in his goals for organizational change emphasizes three elemental areas of importance: human, structural, and technological, all of which provide guidance for safety function development. The following describes the three stages of the conceptual framework for the model developed by the researcher:

5.3.1 Stage 1 - Preparation

The four steps that comprise the preparation stage are:

1. developing a high performance safety team to facilitate the change;
2. performing an assessment to determine the current state of the safety system;

3. developing safety management process goals and objectives aligned with the various business processes as part of a strategic planning effort;
4. discovering an advocate(s) for sponsorship of change for the management of safety.

The first step involves competency development of the nuclear safety staff.

Developing a team model suggests utilizing a common strategy. Katzenbach and Smith (1993) suggest a team model with performance based on behaviors including: mutual support, joint accountability, and a trust based relationship in addition to individual accountability; thinking, working, and doing; people playing multiple roles and working together on continuous improvement; people helping shape direction, and learning; aspiring to personal growth that expands and exploits individual capabilities. Also, Dicle (1969) emphasizes the human element capability development which includes: improving interpersonal capacity, improving skills and relevant knowledge, developing a high degree of mutual trust and support, and a high degree of personal commitment, effecting a change in values through stressing openness and collaboration, cooperation, consensus, authentic relationships rather than political maneuvering, and developing increased understanding within, and among working groups. Dicle's (1969) structural elements provide emphasis areas desirable to achieve as the cultural climate evolves with the planned organizational change which include: maximizing participation in organizational decision making, maximizing free and open communication, minimizing the hierarchy of authority, and minimizing rigid hierarchical structures organization-wide.

In development of the team, consideration should be given to improvement in the provision of information vertically and horizontally. In information redesign, decisions about detailed work flow must often be left to individual safety staff; however, Davenport et al. (1996) suggests three redesign strategies for the process of improved provision of information which are essential. First, the safety function can change knowledge itself by either reducing or creating a unit of knowledge that workers can

reuse or access or by improving knowledge capture techniques. One example of using this redesign strategy is to develop and modularize safety technology transfer information. This would be helpful in a complex and diverse environment as a university so that the safety function can assemble the modules in different combinations based on the need of a specific department to satisfy both needs and requirements. Second, the safety function can improve knowledge work by changing the physical location of where and with whom people work. This change typically involves collocation, new or modified team structures, or new roles. An example of using this redesign strategy is in redefining the role of the safety staff person to what Veltri (1990) refers as shifting to “techno-structure specialists” engaged in management, technical and financial process design. To achieve this new role, investment in safety staff learning is essential. This mandates that group time must be made more effective. The current structure for monthly staff meetings which emphasizes activity reporting from each compartmentalized area is obsolete. Organizational and safety process understanding and model development are essential components for the new direction. This, in turn, must manifest into both a better fit and integration into all components of the university through the changing interactive role with departments outside of the safety function. Third, the safety function can use technology to bolster knowledge work creating knowledge bases and enabling communications infrastructure and applications. An example describing the need for redesigning safety function strategy is in minimizing staff compartmentalization; having separate maintenance of safety reports in various locations. This presents the dilemma of duplication of effort, or missing key historical information. Developing an information cataloging database to track and make available all activities is vital to the redesign.

The labor/management cooperation process, one of the planned organizational change processes examined, has developed a team building module which could be utilized for facilitating development of the safety staff. Use of this team building resource could be

augmented by using outside organizational consultants. The development of the high performance team model is seen by the researcher as pivotal in the success of the entire safety system change effort. There is no such thing as stealth change (Manganelli and Klein, 1994), so managed communication within and by the team is the most powerful tool for the success of the project.

The second step in the preparation stage of the redesigned safety system suggests examination of the environment for planning the safety management model change. For the safety change process to be successful the safety system change team (the constituents of the safety function) must maintain active understanding of and open dialogue with all other functional disciplines both vertically and horizontally across University X. The safety system change team must be sensitive to the various functional viewpoints, priorities, interests and needs. The method by which people of various disciplines receive and process information may vary from discipline to discipline (Lawrence and Lorsch, 1967). This cultural knowledge may help with the success of the safety system change process.

The third step in the preparation stage of the redesigned safety system change model suggests development of a strategic planning model at the departmental level. As part of the emphasis on a systems view of University X and for enhanced strategic planning and team competency, an understanding of the organization and its technical and social systems are vital for achieving both a congruent fit and successful integration. A strategic planning model encompasses the development of the following: strategic intent which envisions achievement of world-class status of a safety management system; a mission statement which guides decision-making toward development of that world-class status; strategic operations which are safety management processes including the anticipatory, value-adding, cross-functional health, safety, and environmental resource networks with goals and objectives aligned with business processes (Veltri, 1990; DeRose, 1994). Planned organizational change goals of University X (Appendix D) are evidence of organizational

direction; safety system change model goals should be parallel with the concepts devised by Veltri (1990) and DeRose (1994).

The last step in the preparation stage of the redesigned safety change model suggests discovering a champion to support the safety change process. When interviewed, the administrator over the safety function said that he encourages creative change. However, it is critical for senior management to sponsor the project. Because of the broad organizational impact, there is an attending cultural shift and it is uniquely senior management's role to establish the culture. Successful change requires leadership of this most visible sort. As Manganelli and Klein (1994) point out, when creating change in a functional department, the safety function, special problems are possible. Customers of the safety process change are people in other functional departments. It is often more difficult to get these internal customers to cooperate than it is to deal with external customers. Therefore, it is critical to secure sponsorship at the executive level.

5.3.2 Stage 2 - Identification

The second stage is identification. This stage emphasizes the understanding of the customer-oriented safety system change model. The safety customer demands results, performance, and information. And those demands need to be met reliably and cost effectively. It becomes important to understand how various functions within an organization and safety processes could interact to provide an improvement in both safety function integration and congruency within a strategic and value-added framework. The steps in stage two are:

1. identify core safety processes
2. identify safety customers

For the safety team to understand the scope of its mandate, core processes need to be understood. These core processes are the primary activities whose outputs (risk, danger, and loss prevention/intervention) customers need or want (Boehringer, 1996).

Using Boehringer's "Process Type Chart" (1996), the researcher has evolved the core processes as follows:

Core Safety Processes

- providing technical safety resources
- providing safety management resources
- providing enablement of safety decision-making
- providing the cross-functional facilitation of safety
- facilitating the development of a safety communication network
- directing safety operations research (Veltri, 1990)

Each of these core processes should add value (customer service) and strategic benefit to the safety system at University X. At this facility, customer constituency is made up of line level employees as the highest priority customers of any safety and health program as well as management at all levels, other staff functions, employees at all levels, visitors, patients, students, resident labor unions, the immediate surrounding community, and the community at large. Each customer group has different needs and desires, and the process of designing each core process must consider this distinction. This is contrasted from the current system using a simple bandage application of technical and compliance driven knowledge in a singular microcosm of line level activity.

5.3.3 Stage 3 - Vision

The purpose of stage three is to develop future or "could be" safety process elements. This vision stage produces improvement and lists objectives for core safety processes, a definition of what changes are required and a statement of a new process "vision" (Manganelli & Klein, 1994). The distilled research data provides guidance for enlarging the dimensions of the core safety processes unique to University X and congruent with current management philosophy. The following is an enlargement of

activities within each of the researcher's core safety processes. The redesign model elements are attached to their corresponding core safety process.

Providing technical safety resources

networking/accumulation of sources of service/information both internal and external

competency of safety team/staff decision-making in multi-technical areas

cost-effective application of technical resources

efficacy of data interpretation and application

analysis of outcome performance at both the customer and strategic levels (reduction of injuries, damage, ineffectiveness, non-compliance, illness, waste, and inefficiencies)

effective safety technology transfer to various customer groups

analysis of safety needs

Providing safety management resources

competency development of safety team/staff in advising within the current organizational environment

competency development of safety team/staff in advising within various customer groups

facilitating the development of safety management capabilities for all customer groups

Providing enablement of safety decision-making

comprehensive information system development to improve decision-making and set priorities

development of models to prepare all customer groups

use of benchmarking data

Providing cross-functional facilitation of safety

leadership development of safety team/staff in project management (management technique employing leadership, planning, reporting, team member guidance and issue resolution to guide cross-functional problem-solving)

integration into all existing committee structures

initiation of new committee structures in anticipation of emerging issues

Facilitating the development of the safety communication network

capability development of safety team/staff in understanding needs of all vertical and horizontal groups

creative development of multi-approaches to aggressive communication strategies

coordination of other resources both internally and externally

Directing safety operations research in both strategic and value added dimensions

collection/analysis/application of benchmarking data from other similar and different institutions

collection/analysis/application of data to evaluate effectiveness of safety intervention methods

collection/analysis/application of data to measure the financial and economic impact of the redesigned safety strategy

collection/analysis/application of data to evaluate customer needs

collection/analysis/application of data to evaluate customer service performance

This model provides a radical conceptual, redesign for safety at the university examined. The data collected from observations, document reviews, and two survey tool responses offered depth of understanding to the shortcomings of the current safety system employed at University X and provided rich opportunities to explore an alternative model emphasizing systems view, process orientation, and customer service. Each of the alternative strategies suggested as countermeasures was anchored in significant supporting evidence found in business and management literature. This model offers a starting point from which to deepen and expand value-adding processes identified in the model.

5.4 Analytical Generalizations

The researcher believes that several analytical generalizations can be drawn from this case study. These analytical generalizations suggest that the methods used here may be applied as vehicles for examining other cases. The use of the French and Bell (1990) model

for evaluating and comparing specific parallel processes in both the organization and a unique function, and subsequently, designing change to improve the efficacy of that function within the organization offers a way to examine congruency. The theory that evaluating and improving congruency or fit can improve the operation of an organizational function can be utilized beyond the safety function and applied to any substructure of an organization with the intent of planning, updating, and harmonizing functional activities.

Petersen (1994) has suggested that to gain insight into the success of a safety function within an organization an employee perception survey could be used. This approach was used by the researcher to gain insight into how well safety was integrated into an organization. The theory that evaluating and improving safety function integration can improve safety function activity results can also be applied to other safety functions and other functions within an organization. This concept is interpolated from the evidence presented in organizational and management literature that understanding the needs and wants of the population served, and developing a strategy to provide a high level of service can leverage value toward success of an organization.

Aspects of viewing an organization as a system, an emphasis on customer service, use of viewing activities as processes, and an emphasis on employee investment and satisfaction dominate the business and management literature regarding predictors for achieving organizational success. The theory that viewing the safety function as part of a larger system is crucial to developing processes for serving various populations associated with an organization is a predecessor to evaluating, designing, and implementing any change in strategy for that function. The previous theory components can be applied by other safety functions in various organizational environments. With this concept in mind, the chance of a more thorough understanding of the environment in which a safety function must thrive is greatly improved.

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APPENDICES

APPENDIX A

Organizational Process Survey Tool

1. Communications patterns, styles and flows:

Field Notes:

— Information sought:

Is communication directed upward, downward, or both? Are communications filtered? Why? In what way? What is the climate of communication? What is the place of written vs. oral communication? Include within the group/committee, and between group/committees and general constituency.

2. Goal setting

— Information sought:

Does the group/committee set goals? How is this done? Who participates? Are both long and short goals set? Has a mission been developed? How are skills developed for effective goal setting? Who was involved in the process? How are criteria to measure developed?

3. Decision making, problem solving and action planning.

— Information sought:

How are decisions made? How are skills developed?

4. Conflict resolution and management

— Information sought:

Include interpersonal, intrapersonal, intergroup. Where does conflict exist? How is it being managed?

APPENDIX A (Continued)

5. Managing interface relations

Field Notes:

—Information sought:

What is the nature of the relations between groups/committees? Are goals clear? Is responsibility clear? What major problems are encountered? What structural conditions promote/inhibit effective interface management?

6. Supervisor - staff relations

—Information sought:

What is leadership climate? What problems arise?

7. Technological and engineering systems

—Information sought:

How is information managed? How are policies and procedures developed and used? How current is the technology used?

8. Strategic management:

—Information sought:

How is the future incorporated into the change or safety process? What are unique strengths and competencies of the group/committee? What are the threats to the group/committee? How is the long term viability of the organization affected?

APPENDIX B

Organizational Process Analysis Matrix

	Communi- cation	Goal Setting	Decision- Making	Conflict Resolution	Interface Relations	Supervisor Staff Relations	Technology and Engineering Systems	Strategic Management
Safety Management								
Labor Management								
Public Corporation								
Hospital- Clinic Restructuring								

APPENDIX C

Perception/Knowledge/Interaction Survey Tool

Demographics

How long have you been with this university?

In what capacities?

What is your current role?

Perception-knowledge-interaction

In your opinion where does accountability for health and safety lie?

What is your current perception of the role of Environmental Health and Safety on this campus?

How would you describe the effectiveness of the safety process on this campus?

Do you see a need for the current safety process to be customer oriented?

Why? or why not?

Have you had occasion to become involved in any capacity on a safety related issue?

If yes, please describe the process.

Was there a satisfactory resolution? (were all parties satisfied?)

What programs/processes do you see as being related to safety?

In general, do you believe that managers and supervisors are supportive of health and safety related issues?

In general do you see managers and supervisors take a proactive role regarding health and safety issues in dealing with their staff?

In your opinion what are the most important safety issues faced by this university?

Are you a member of any committee(s) that address safety issues on this campus?

If yes, which one(s)?

Do you receive minutes from any safety committee on campus?

If yes which one(s)?

APPENDIX C (Continued)

For each committee, how did you become involved with the committee(s)?

What do you think is the role of this committee?

Would you like to see changes in the structure or functioning of the(se) committee(s)?

If yes, what changes?

If yes, why?

Do you see any challenges to the process of improving the committee(s)?

Do you see improvements that could be made to the safety process on this campus?

How do you think the safety process currently contributes to the long term objectives and goals of this university?

End of interview:

Are there any other aspects of the safety process at this university that I have neglected to ask about? Or that you would like to comment on?

APPENDIX D

Planned Organizational Change Goals

Labor/Management Cooperation Goals

- 1. enhance quality of customer service**
- 2. continuous improvement of quality of worklife**
- 3. continuous improvement in the effectiveness and quality of work performance**
- 4. development of joint labor and management consensus building**
- 5. development of joint labor and management problem-solving**
- 6. movement along a continuum at the departmental level toward self-directed work teams**
- 7. development of in-house facilitation teams for quality improvement**
- 8. movement toward the use of strategic planning at the departmental level**

Public Corporation Goals

- 1. increase efficiency of operation**
- 2. ability to make decisions at the level of deepest understanding of organizational needs**
- 3. inclusion of labor/management cooperation principles**

Hospital/Clinic Restructuring

- 1. economic streamlining of operations using economic indicators**
- 2. increase competitive advantage**
- 3. inclusion of labor/management cooperation principles**

APPENDIX E**“Memo” Sample****1/28/96****MEMO TYPE****Memo 1 Preliminary****INTENT**

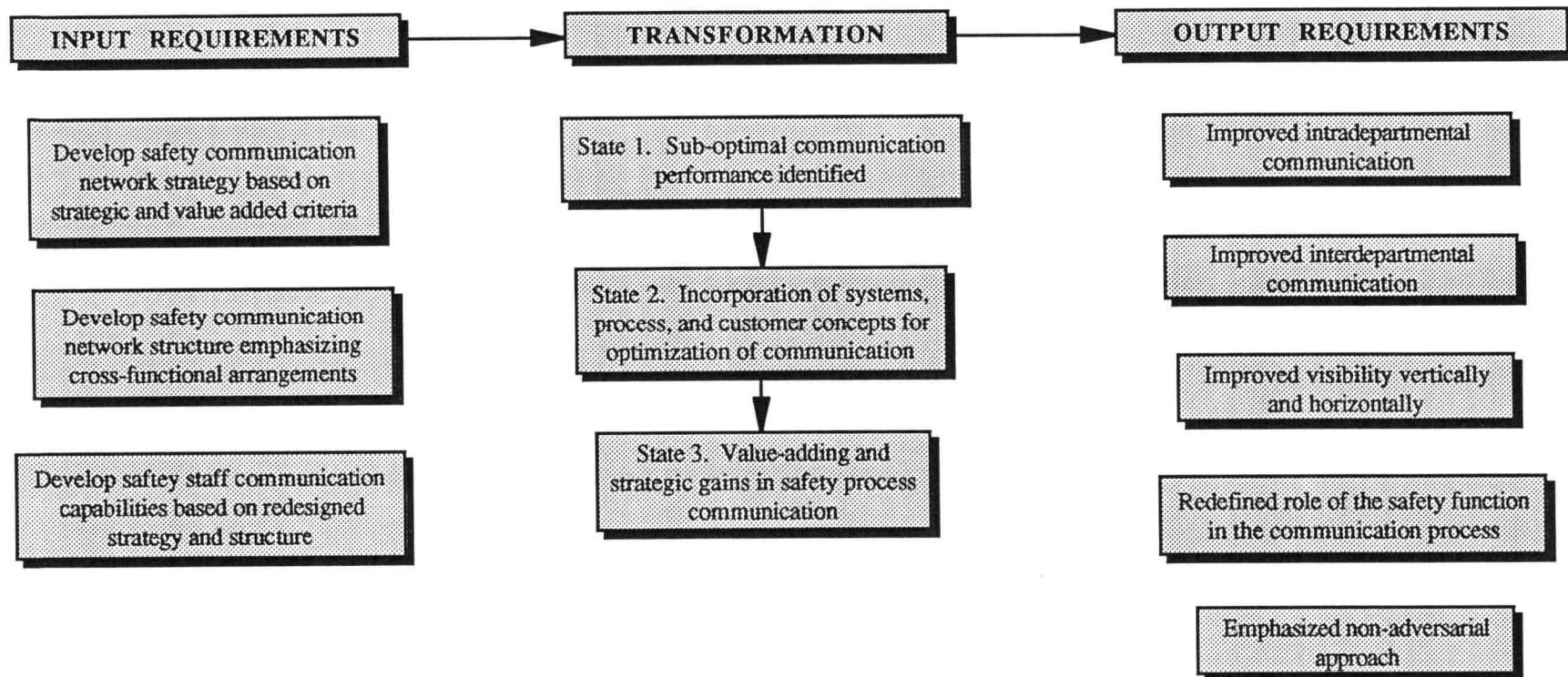
To focus on objectives of research and to stimulate thought of analysis and data collection along these lines

COMMENTARY

Want to develop an operational model for a safety management function at University X. Want to discover model framework using systems concept. Need to examine case study methodology and qualitative analysis. Want to look at process alignment with ongoing organizational change. Need to look at perception of the safety management function to understand fit. Use of interviews, documents and observations. Use of in vivo and constructed information. Who to interview for planned change? Who to interview for perception? Need to develop tools for interviewing.

APPENDIX F

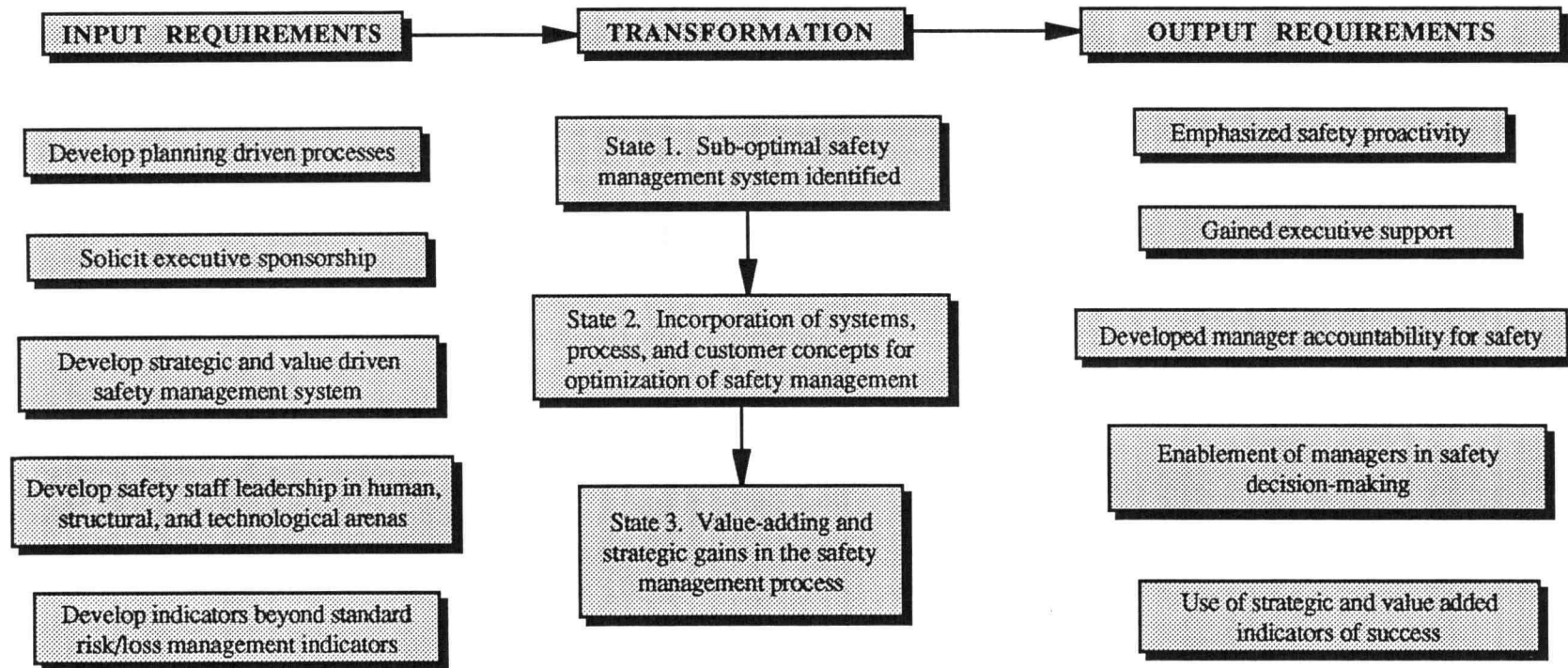
Safety Communication State Change



This shows a communication state change chart where the "output requirements" have been distilled from the research findings, and the "input requirements" were developed as needed elements for achieving the "desired outputs". The state change steps are shown in the "transformation" column stating the broad steps or "state changes" needed to achieve the process (Boehringer, 1996).

APPENDIX G

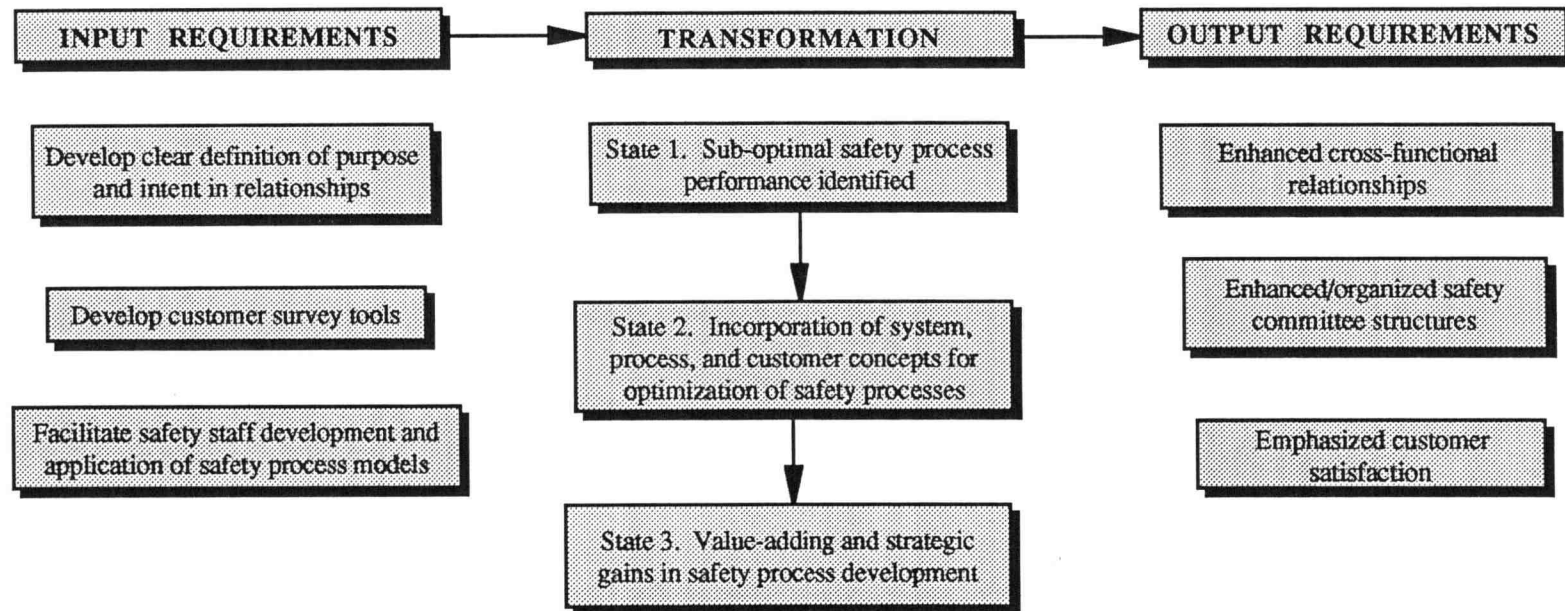
Safety Management State Change



This shows a safety management state change chart where the "input requirements" have been distilled from the research findings and the "input requirements" were developed as the needed elements for achieving the "desired outputs". The state change steps are shown in the "transformation" column listing the broad steps or "state changes" needed to achieve the process (Boehringer, 1996).

APPENDIX H

Safety Process State Change



This shows a safety process state change chart where the "output requirements" have been distilled from the research findings and the "input requirements" were developed as needed elements for achieving the "desired outputs". The state change steps are shown in the "transformation" column stating the broad steps needed to achieve the process (Boehringer, 1996).

APPENDIX I

List of Definitions

Coding - The attachment of meaningful labels to data chunks of varying size-words, phrases, sentences, or whole paragraphs. Coding is analysis. It begins at the collection of the first piece of data. The initial data are written up, and reviewed line by line, typically within a paragraph. Beside or below the paragraph, categories or labels are generated, and a list of them grows. The labels are reviewed and, typically, a slightly more abstract category is attributed to several incidents or observations (Strauss, 1987).

Competency - According to Fahey and Randall (1994) competency can be represented by an equation as follows: competency = (bundling of technology) x (management of complex processes) x (facilitation of vertical and horizontal learning).

Congruency - The term fit, congruence, or alignment refer to the extent to which the behavioral or organizational requirements and the constraints in one part of a system are compatible with those in another (Harrison, 1987). The researcher sees the challenge for a safety manager as working toward behavioral and organizational compatibility of the safety function within it's unique organizational environment.

Construct validity - This establishes correct operational measures for concepts being studied. Case study tactics that emphasize construct validity are: using multiple sources of evidence, establishing chain of evidence, and having key informants review draft case study report (Yin, 1985).

External validity - This establishes a domain to which a study's findings can be generalized. This suggests development of analytical generalizations where the investigator is striving to generalize a particular set of results to some broader theory (Yin, 1985).

Gap - The difference between the present state of safety and some future or ideal state of safety (Boehringer, 1996).

Grounded theory - The discovery of theory from the data through the general method of comparative analysis. Qualitative data is placed into categories and then, through constantly comparing the content of them, defines the properties of the categories until they have taken on an abstract form (Strauss, 1987).

Integration - The more tasks, technology, and environments of other units vary from one another, the more the structures become differentiated. Once organizations become differentiated internally, they face serious problems of integration (Lawrence and Lorsch, 1967). The researcher sees the challenge for the safety manager as discovering and working around barriers vertically and horizontally.

Memoing - The documenting of emerging analytic notions which help to identify emergent themes, patterns, or explanations and generate ideas for further data collection (Tesch, 1990).

Reliability - This demonstrates that the operations of a study can be repeated. Case study tactics that emphasize reliability are: develop a case study protocol, and develop a case study data base (Yin, 1985).