



Master of Applied Science (Occupational Health and Safety)

Thesis

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**The Effectiveness of Team-Based Approaches to Improving
Health and Safety: Case Studies from Australian
Industry in the 1990's**

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Abstract

In the 1990's, Australian organisations are increasingly turning to team-based approaches to work, including health and safety. A review of the literature relating to team work and health and safety reveals a dearth of research in this area. This paper contributes to the research by exploring perceptions of the effectiveness of team-based approaches to improving health and safety. Two Australian industries are used as case studies. Two types of team-based approaches to improving health and safety are studied. In the first case, risk improvement teams within a large provincial health care centre are studied. The second case studies the effectiveness of integrating health and safety into the role and responsibilities of self-directed work teams in a large chemical company. Research data relating to perceptions of effectiveness and factors associated with effectiveness is gathered using focus groups and semi-structured interviews with team members, their customers and the person responsible for health and safety. Data for each case study is analysed independently. An ethnographic approach to data analysis is used. This study found that the self-directed work teams with a responsibility for health and safety were perceived to be effective, whilst the effectiveness of the risk improvement teams was perceived to vary. It is concluded that team-based approaches to improving health and safety are generally effective, although the evidence is generally anecdotal and at times inconclusive, varying across industry, within industry and across team types. A model for the development of effective team-based approaches to improving health and safety is proposed.

Key Words

Teams, Groups, Team Work, Teamwork, Health and Safety, Effectiveness, Performance, Improving, Participation, Consultation, Self Directed Work Teams, Risk Improvement Teams

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1.0 Introduction

According to a recent Australian study, a new trend towards team-work is penetrating organisations (Austen, 1995). Katzenbach and Smith (1993, p.5) argue that *managers cannot master the opportunities and challenges now confronting them without emphasising teams far more than ever.*

This trend is also evident in health and safety and Trautlein and Milner (1994, p.27) describe this trend as signifying *a paradigm shift in how workplaces approach safety.*

At this point in time there is a dearth of research in relation to the effectiveness of team based approaches to work (Hackman, 1987). The same is true for health and safety. Cohen and Ledford (1994, p.2) argue that *the effects of team-based approaches on health and safety have been less systematically studied and the results are inconsistent.*

Highlighting this inconsistency, studies conducted by Caple et al (1997) within the Australian automotive industry found team-based approaches to improving health and safety using natural work groups to be effective. In contrast, an American study conducted by Cohen and Ledford (1994) found that a move to self-directed work teams had not improved safety and concluded that different factors contribute to different dimensions of effectiveness.

This leaves Australian organisations implementing team-based approaches to improving health and safety with a knowledge gap.

This paper is a step towards closing this knowledge gap by studying the effectiveness of two types of team-based approaches to improving health and safety, drawing upon case studies from the chemical and health sectors of Australian industry.

2.0 Aim and Objectives

2.1 Aim

Using case studies from Australian industry, the aim of this research project is to study team members' and their customers perceptions of the "effectiveness" of team-based approaches to improving health and safety, and to identify the organisational and team factors that may enhance effectiveness.

2.2 Objectives

1. To conduct a review of the literature relating to team work and health and safety, team work and management, the design of effective work teams and the historical development of consultative and participatory approaches to work/health and safety.
2. To use two different types of team-based approaches to improving health and safety as case studies.
3. To conduct focus groups and semi-structured interviews to collect data on perceived "objective" and "subjective" measures of "effectiveness", and to identify the organisational and team factors that support effective teamwork.
4. To analyse each case study independently, and to analyse the data in the context of theoretical models of effective team design.
5. To propose a set of guidelines for implementing effective team-based approaches to improving health and safety.

3.0 Literature Review

To enable this research project to fulfil its aim, a review of the literature has been undertaken in accord with the following research objective:

To conduct a review of the literature relating to team work and health and safety, team work and management, the design of effective work teams and the historical development of consultative and participatory approaches to work/health and safety.

This literature review begins by defining team work and presenting the different types of team-based approaches available to organisations. The review proceeds to a consideration of the history, drivers and effectiveness of team-based approaches to work and health and safety. As a means of pointing the way forward, this review concludes by considering a range of models that attempt to explain effective team work. These models are used to inform the research methodology.

3.1 An Introduction to Team Work and Work

To understand team work at work, it is useful to firstly understand what a team is (and is not) and secondly, to understand the different types of teams. This section reviews a range of definitions of team work and attempts to distinguish between 'teams', 'groups' and 'committees'. The definitions apply to a variety of team types and these are also presented and discussed.

3.1.1 Definitional struggles

Definitional struggles arise when attempting to define 'team work'. These struggles are due to the overlapping use of the words 'team', 'group' and 'committee'. A group may not always be a team, whilst a committee may or may not exhibit the characteristics of either a team or group. This section will attempt to resolve these definitional struggles brought about by the overlapping use of the language.

The *Concise Oxford Dictionary* (1990) defines 'team', 'group' and 'committee' in the following ways:

committee: ... *body of persons appointed for a specific function ...*

group: ... *a number of persons or things located close together ...*

team: ... *two or more persons working together ...*

Using these definitions, teams are distinguished from groups and committees on the basis that team members work together, this is not necessarily the case for a group or committee.

Hackman (1990, p.4), when discussing organisational groups and performance (notably, in a chapter titled *Work Teams in Organizations*; emphasis added), defines groups (in part) as:

... intact social systems, complete with boundaries, interdependence among members, and differentiated member roles ...

Cohen and Ledford (1994, p.4) define *self-managing teams* as:

... interdependent groups that are organized around a particular customer service or equivalent responsibility, that are characterized by high levels of employee involvement in decisions, and that use non-traditional structures and management practices.

Wellins et al. (1991, p.3) define a *self-directed work team* as:

... an intact group of employees who are responsible for a "whole" work process or segment that delivers a product or service to an internal or external customer.

Osburn et al. (1990, p.8) define a *self-directed work team* as a:

... highly trained group of employees, from 6 to 18, on average, fully responsible for turning out a well-defined segment of finished work.

What is common among these definitions is that the words 'group' and 'team' are used interchangeably, however, a committee is never mentioned. It could be that these definitions are suggesting that a team is always a group.

Shea & Guzzo (1987, p.25) stick firmly to the use of the word 'group' when discussing effectiveness, defining a group as :

A set of three or more people that can identify itself and be identified by others in the organization as a group.

However, Katzenbach and Smith (1993) argue that groups become teams through *disciplined action* (Katzenbach and Smith, 1993, p.14). Disciplined action refers to team attributes such as the ability to develop a common purpose and performance goals, and to be mutually accountable for results (Katzenbach and Smith, 1993). They distinguish a *team* from a *group* and offer the following definition of a *team*:

A team is a small number of people with complimentary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable. (Katzenbach and Smith, 1993, p.45).

Guzzo and Dickson (1996, p.1), in a more recent review on team performance in organisations, acknowledge that the word 'team' has largely replaced the word 'group'. They admit to using the words interchangeably, recognising that there may be *degrees of difference, rather than fundamental divergences* as argued by Katzenbach and Smith (1993) (Guzzo and Dickson, 1996, p.2). Building upon the work of Hackman (1987) they adopt a definition of a *work group* as being:

... made up of individuals who see themselves and who are seen by others as a social entity, who are interdependent because of the tasks they perform as members of a group, who are embedded in one or more larger social systems (eg. Community, organization) and who perform tasks that affect others (such as customers or coworkers) (Guzzo and Dickson, 1996, p.2)

Sundstrom et al. (1990, p.120), in discussing work team effectiveness define *work teams* as:

... interdependent collections of individuals who share responsibility for specific outcomes for their organizations.

The theme that emerges from this discussion is that both groups and teams display interdependence among their members. Further, it is possible to argue that the terms ‘group’ and ‘team’ may be used interchangeably, but teams and groups are not committees, presumably because committees do not share the interdependence among committee members. This distinction is important, as health and safety has historically relied upon committee-based approaches to consultation and health and safety improvements.

This discussion also highlights the need to consider the range of team types to which the various definitions have been applied.

3.1.2 Types of teams

In attempting to understand the range of team types, authors use conflicting language and a mix of team type categories.

For example, Hackman, (1987, p.334) identifies three types of teams:

- 1. Manager-led work teams*
- 2. Self-managing work teams*
- 3. Self-designing work teams*

In contrast, Katzenbach and Smith (1993, p3) categorise teams according to the teams capacity to *recommend things, make or do things or run things*.

Ray and Bronstein (1995, p.10) argue that there are five types of groups:

- Type 1: Leader Centered/Leader Focused*
- Type 2: Leader Centered/Function Focused*
- Type 3: Leader Centered/Integrated-Tasks Focused*
- Type 4: Self-Led/Time and Task Focused*
- Type 5: Self-Led/Task Focused*

Moran et al. (1996 pp.14-15) argue that there are four types of teams commonly in use in workplaces today:

1. Intrafunctional Teams
2. Problem-solving Teams
3. Cross-functional Teams
4. Self-directed Work Teams

Romig (1996, p.254) argues that team types may be understood from an empowerment continuum comprising six stages of empowerment:

Stage 1: Employee Surveys and Focus Groups

Stage 2: Employee Suggestion Systems

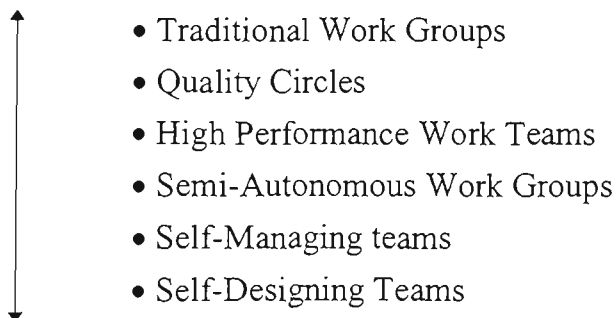
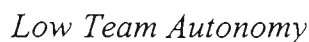
Stage 3: Quality Circles and Problem Solving Groups

Stage 4: Participative Decision Making

Stage 5: Semiautonomous Teams

Stage 6: Autonomous Teams

Banker et al. (1996, p.868) categorise the team types they found in manufacturing environments along a team autonomy continuum from low autonomy to high autonomy as follows:



High Team Autonomy

In summary, as well as conflicting language and in-consistent team type categories, there are many types of team-based approaches. Team type may be dependent upon the degree to which an organization is prepared to empower employees and the nature of the task that the team is to complete.

Team-based approaches to health and safety could range from self-directed or self-managed work teams through to project and improvement teams.

The historical development of team work in relation to work/health and safety is discussed in the next section.

3.1.3 A brief history of teams at work and health and safety

According to Katzenbach and Smith (1993, p.9), *teams outperform individuals acting alone or in larger organisational groupings* ... If this is the case, then it is important to consider the historical development of team work at work, with specific reference to health and safety.

According to Wellins (1991, p.5) teamwork is not a new concept. In fact Sundstrom et al (1990, p.120) argue that there have been two *watershed events* that have highlighted the benefits of work teams; the Hawthorne studies and European experiments with autonomous work groups. Smart (cited in Austen, 1995) also agrees that teamwork is not a new concept, arguing that Mary Parker Follett identified the benefit of teams in the 1920's.

Mary Parker Follett, an American, advocated the replacement of bureaucratic organisations with group networks that identified problems and developed and implemented their own solutions (Mumford, 1996). According to Mumford (1996, p.50) Mary Parker Follett advocated the principles of *power with, joint responsibility and multiple leadership* rather than power over.

The Hawthorne studies, which also begun in the 1920's at the Hawthorne plant of Western Electrical Company near Chicago, revealed a need to focus not only on the technical components of work, but also the social systems at work (Baron, 1986). This work led to a new perspective known as the *human relations approach* (Baron, 1986, p.19). This approach focused more attention upon human needs in the work place (Baron, 1986). Mumford (1996, p.53) claims that Elton Mayo was the founding father of the human relations movement. According to Mumford (1996) Mayo found that worker productivity and motivation increased when workers were consulted, given responsibility to pace their work and treated as partners.

Lawler (1986, p.101) also concurs that the *history of work teams has a decidedly European flavour*. Lawler (1986), Wellins et al. (1991) and Osburn et al. (1990) agree

upon the importance of the work carried out by Eric Trist and others from the Tavistock Institute in British coal mines in the 1950's. This study focused upon the sociotechnical design of work. In the coal mine studies, researchers found that workers had created their own autonomous groups (Mumford, 1996). Compared to the traditional approaches to mining, the group approach had led to *higher productivity and job satisfaction* (Lawler, 1986, p.102). The coal mines studies also revealed that safety and health performance was superior under the composite 'group' system (Cox and Cox, 1996, p.107).

Manz, (1992, p.1121) goes so far as to argue that sociotechnical systems theory (theory upon which the coal mines studies were based) is in fact *the primary theoretical basis for self-managing teams* at work as it *optimizes both the social and technical components of the work environment*.

Drawing upon the work of the Tavistock Institute, Sweden began experimenting with team based approaches to work in the 1970's, most notably at the Volvo Corporation plant in Kalmar (Wellins et al. 1991).

The Emergence of Team-based Approaches to Improving Health and Safety
Whereas the history of team-based approaches to work spans at least 70 years, the historical development of team-based approaches to improving health and safety is young by comparison, spanning just over 20 years. This section will discuss the emergence of consultative approaches to improving health and safety in the early 1970's and the eventual convergence of the principle of consultation with quality approaches to work, resulting in the emergence of team based approaches to improving health and safety.

Paralleling organisational experiments with participative approaches to work were moves in the United Kingdom that recognised the importance of involving employees in decision making in relation to workplace health and safety. The Robens Report (1972) was instrumental in setting this direction in the mid seventies, recommending (but not being limited to) such consultative and participative structures as health and safety representatives and health and safety committees.

However, the Robens Report (1972, p.19) cautioned that:

... safety representatives and joint safety committees are not the only methods of seeking to increase the involvement and commitment of workpeople

and that:

... the form and manner of such consultation and participation would not be specified in detail, so as to provide ... flexibility

These comments indicate that Robens was arguing in favour of the principle of employee consultation and participation in relation to improving health and safety at work.

During the eighties and early nineties, team-based approaches to work and participative approaches to health and safety converged under the umbrella of total quality management. W. Edwards Deming, an American statistician had taken the ideas of quality management to Japan in the late 1940's (Walton, 1986). The Deming philosophy embodied continuous improvement and employee empowerment. It was a philosophy which was to be eagerly adopted by health and safety professionals who wrote at length in the popular safety journals of the nexus between quality and safety (Dandekar et al, 1993, Emerson, 1991, Lischeid, 1994, Petersen, 1994, Roughton, 1993 and Vincoli, 1991). This convergence is best summed-up by Roughton, (1993, p.35):

Participative management is a primary link at all levels of a TQM and safety system ... Continuous safety and health improvements will not occur unless a deliberate change is made in the safety and health system. Deming integrates management responsibility and employee involvement through extensive use of ... quality improvement teams.

Fisher (1991, p.25) goes on to argue that in relation to employee involvement, *the traditional TQM approach of using employee groups or teams at all levels is an appropriate mechanism.*

Globally, the move to, and study of team based approaches to improving health and safety appears to be most wide spread in the United States of America (USA). So much so that the National Safety Council (NSC), (1994) in its document *14 Elements of A Successful Safety & Health Program* at element seven, 'Employee Involvement', specifically recognises the new team-based approaches to work by stating (NSC, 1994, p.84 and 85) :

The joint safety and health committee is an established vehicle for implementing employee participation. However, as new operational structures emerge internationally, new avenues are opening for employee involvement. The team concepts that are driving competition worldwide can be applied to both traditional and emerging structures to improve safety and health performance.

In Australia, a 1995 Industry Commission inquiry into health and safety at work, conducted on behalf of the Commonwealth Government, reported that quality management and team-based approaches to improving health and safety represented best practice (Industry Commission, 1995). Significantly, the report also identified that (Industry Commission, 1995, p.64):

... there is no guarantee that mandating a particular form of consultation (for example, committees) will necessarily lead to effective consultation

and that:

... it is important that legislative provisions for health and safety committees do not inhibit other forms of consultation ... Restricting the form of legally sanctioned participation to employee health and safety representatives would be counter-productive if it deterred active participation by other employees

Historically, the wheel has turned full circle. The remarks of the Industry Commission Inquiry echo the recommendations of the Robens Report twenty years earlier. That is, it is the principle of consultation that is important. The implication is important here, that is, organisations should be given the flexibility to adopt alternative approaches to employee consultation, such as team-based approaches, and

not feel restricted by legally sanctioned consultative mechanisms. Perhaps this highlights the inability of legislation to keep pace with and reflect organisational change.

Current thinking on team-based approaches to health and safety is best summed up by Trautlein and Milner (1994, p.27) who go so far as to say that *new systems of work organisation, such as team based environments ... signify a paradigm shift in how workplaces approach safety*. If this is the case, the question remains, have these team-based approaches been effective?

3.2 The Effectiveness of Team-based Approaches to Improving Health and Safety

Research into the effectiveness of team-based approaches to work and the factors that contribute to team effectiveness is generally lacking (Cohen et al., 1996, Dunphy and Bryant, 1996 and Hackman, 1987). However Guzzo and Dickson (1996) in a recent review of the literature found that research into team effectiveness is increasing, but for work groups, the research findings vary, and that the effectiveness of work groups on measures of effectiveness such as productivity and turnover is situationally dependent.

To set the scene, this section begins by considering how effectiveness is measured.

3.2.1 Measuring and defining effectiveness

Lawler (1986) claims that the forces of change will require organisations to be more effective to remain competitive. Lawler (1986, p.21) argues that *employee participation can significantly improve organizational effectiveness*. Lawler argues that there are a variety of participative approaches open to organisations, and that there is a relationship between participation and motivation. Lawler (1986) cites team work as one form of participation. Lawler (1986, p.43) argues that the effectiveness of participative programs can be expressed by the following equation:

$$\text{Effectiveness of Participative program} =$$

$$\text{Rewards} \times \text{Knowledge} \times \text{Power} \times \text{Information Flow}$$

The degree of effectiveness may be measured on a scale of 0 -1 (Lawler, 1986). Zero equates with none of the particular attribute being present; one equates with the *a great deal* of the attribute present (Lawler, 1986, p.42)

Other researchers define and measure the "effectiveness" of team work differently.

Hackman (1987) measures group effectiveness on the basis that the output of the group is acceptable to those who receive it, that the group members would be willing to work together again, and that group members are satisfied with the group experience. Hackman argues that:

... the fact is that reliable, objective performance measures are rare in work organizations. Even when they do exist, what happens to a team usually depends far more on others' assessment of its output than on any objective performance measure (Hackman, 1990, p.6).

Cohen et al. (1996) suggest effectiveness may be viewed from four perspective's, the employee, the manager, quality of worklife and withdrawal behaviours. Employee and manager ratings of effectiveness rate the performance of the team in a number of areas including quality, productivity and safety (Cohen et al. 1996).

Sundstrom et al. (1990) relate team effectiveness to team performance and viability. In discussing team performance, Dunphy and Bryant (1996, p.1) argue that *organizational performance is the ultimate criterion by which the utility of teams must be judged*. The authors go on to argue that there are three areas of organisational performance of most interest to managers, cost, value and innovation (Dunphy and Bryant, 1996). The authors argue that these three areas may be used to measure team performance and hence effectiveness. The authors argue that there is in fact a need for new measures of team performance and that:

... appropriate measures need to be established and made if empirical studies are to prove valuable to managers who are seeking to evaluate the potential performance contributions of team interventions (Dunphy and Bryant, 1996, p.15).

Guzzo and Dickson (1996) also equate "effectiveness" with "performance" but argue *that there is no singular, uniform measure of performance effectiveness for groups* (Guzzo and Dickson, 1996, p.2). Instead, the authors define "effectiveness" in relation

to group outputs (including customer satisfaction), the affect the group has on its members, and the ability of the members to work together in the future (Guzzo and Dickson, 1996). This exploration of "effectiveness" the authors admit is similar to that of Hackman (1987) and Sundstrom et al. (1990).

What emerges from exploring "effectiveness" is that there does not appear to be a universal definition or measure of "effectiveness". Some authors like Sundstrom et al. (1987) and Cohen et al. (1996) and Dunphy and Bryant (1996) equate "effectiveness" with "performance", whilst Hackman (1987) equates "effectiveness" as being much more related to the social needs of the group. The final words on "effectiveness" rest with Lord Robens (1972, p.21) who stated that in relation to health and safety:

It is generally accepted that there is no credible way of measuring the value of consultative and participatory arrangements in terms of their direct effect upon day-to-day safety performance.

3.2.2 Research findings in relation to team work and health and safety

Research findings in relation to team work and health and safety are predominantly based upon data from the USA, with one Finnish study and a number of Australian studies. However, there have been few systematic studies, with heavy reliance upon anecdotal evidence from industry.

The USA Experience

According to Kedjidjian (1994, p.50) *Teamwork. It's as American as ... well, baseball*. Further, Kedjidjian (1994, p.50) argues that groups of employees *called work teams, self directed work forces, manufacturing cells ...* are taking on responsibility for managing themselves, including the responsibility for managing safety. The results of this move have been *outstanding safety performance* (Kedjidjian, 1994, p.51).

Beyond the rhetoric, the USA does contribute much of what is written (and possibly known) in relation to the effectiveness of team-based approaches to improving health and safety. However, the literature indicates that the USA has only recently recognised the importance of the principle of employee consultation in relation to health and safety. For example, McClay (1995, p.45) when discussing employee

empowerment, identifies the unique role employees can play in identifying and controlling hazards, and therefore, *safety teams and committees are becoming more popular*. Tyler (1992) argues that the biggest challenge is to harness employee participation and involvement in safety. On this basis, the USA is a late player in the game, the Robens Report recognised the same benefits of employee involvement twenty years earlier! As a result however, the term 'team' takes on a diverse range of meanings in the USA from 'safety committee' to general 'employee consultation'.

Of the remaining literature, systematic and anecdotal studies of the effectiveness of team based-approaches to improving health and safety are reported across a diverse range of industries. Two themes that emerge from the literature are the use of teams to solve ergonomic problems and to modify employee behaviour.

This discussion starts out by considering Cohen and Ledford's (1994) cross-sectional study of self-managing teams within a USA telecommunications company. The researchers predicted that self-managing teams would out-perform traditional work groups on such measures as productivity and quality. The researchers also investigated the effects of self-managing work teams on health and safety. The researchers found that:

... the effects of self-managing teams on absenteeism, safety, and health have been less systematically studied and results are inconsistent ... Some in the union movement ... have argued that self-managing teams and other team-based interventions are a form of "management by stress" that have long-term negative effects on worker safety and health. Overall, there has been a paucity of high quality studies (Cohen & Ledford, 1994, p.2&3).

Safety performance for this study was tracked using accident records over an eight month period (Cohen & Ledford, 1994, p.8). The study revealed no significant difference in the number of work days lost due to accidents and concludes *that serious accidents were no more or less likely in self-managing teams* (Cohen & Ledford, 1994, p.12). However, the results of this study could be questioned. Firstly, on the basis that serious accidents are one indicator only of safety performance and secondly, that the study was conducted over a short time span (perhaps insufficient to capture accurate trends in injury reduction).

Overall, the study found self-managing teams more effective than traditional work groups in relation to productivity and quality of work life (Cohen & Ledford, 1994, p.16). However, in relation to health and safety, the researchers acknowledge that the participating organisations did not place any special emphasis on health and safety within the teams. The researchers assert that the *establishment of self-managing teams do not automatically improve safety* (Cohen & Ledford, 1994, p.17) and that the effects of self-managing work teams are *limited to direct targets of intervention* (Cohen & Ledford, 1994, p.17).

The researchers argue that the findings of this study highlight the need to establish *comprehensive outcome measures* (Cohen & Ledford, 1994, p.18). They go on to recommend that:

The design or implementation of self-managing teams may need to be different if the intended outcome is improved safety as compared to improved productivity (Cohen & Ledford, 1994, p.18).

There are a number of anecdotal studies supporting the effectiveness of team-based approaches to improving health and safety across a variety of industries and these studies have been reported in the popular American safety journals.

Ainsworth (1993) and Smith (1994a) report that team-based approaches within the chemical industry have lead to reductions in injury rates. The introduction of teams however has faced union opposition as teams and higher levels of employee and employer cooperation pose a threat to the traditional role of unions (Ainsworth, 1993). Smith (1994a) discusses the team-based approach to improving health and safety adopted by Shell, the Eastman Chemical Company and the Mooney Chemical Company, arguing that teams develop better solutions to health and safety problems.

Boise Cascade's Rumford Mill (Minter, 1995) and Weyerhaeuser's Pulp and Paper Mill (Smith, 1994b) have successfully used team-based approaches to reduce injuries within the pulp and paper industry. Smith (1994b) argues that because teams are self managing, they are better able to set their own goals, and solve problems.

Miller's Milwaukee Brewery also use a team-based approach to improving health and safety, resulting in a reduction in injuries (Smith, 1995a). At Miller's, safety is a star point - one of five business priorities (Smith, 1995a). Each team takes responsibility for the five star point areas and appoints a point person who is responsible for that point (Smith, 1995a). Workers rotate through the safety star point, providing all workers with the opportunity to be directly involved in improving health and safety (Smith, 1995a). For the brewery, this approach has resulted in a faster response to safety concerns (Smith, 1995a).

The Saturn Corporation, an automobile manufacturer, operates a similar team-based approach to that operated at Miller's. According to LaBarr (1994, p.42) *Saturn has found that production workers and teams, when properly trained and empowered, can be responsible for their own safety and health and that of their coworkers*. Saturn uses a *safety point person* (LaBarr, 1994, p.43) system similar to Miller's. The results for Saturn have been that up until 1994, and after three and a half years of production, there have been no deaths or loss of limbs (LaBarr, 1994).

Smith reports that safety improvement teams have been used to reduce injuries in the Tennessee Valley Fossil and Hydro Power Authority (Smith, 1995b), whilst a network of safety committees was used successfully to reduce injuries at the Lehigh Valley Hospital (Smith, 1995c). Colledge (1995) reports that Union Pacific Railroad successfully used a team-based approach to reduce its injury rate.

Whilst many of the industries discussed already have used teams to solve health and problems to reduce injuries, there are a number of industries using teams as a vehicle for behaviour modification in an effort to reduce injuries. For example, within the Mecklenburg County Engineering Department, peer pressure is used so that workers do not have accidents, and is combined with a team approach to health and safety problem solving (LaBarr, 1995). However, perhaps the most useful learning point to emerge from this case is not in relation to behaviour modification but in relation to teams working within one department of an organisation, but not another.

Mecklenburg County Engineering Department found that:

... a program which succeeds in one department area, with one group of employees, does not necessarily transfer as successfully to another department area, with another group of employees (Lanier, 1992, p.24)

Lanier (1992) claims that the barrier to the success of the team in other departments was organisational culture, that is, the team based program was interpreted as another form of management control (Lanier, 1992).

The use of teams to modify behaviour is also used by Kaiser Tennen - manufacturers of aluminium rod and bar (Willis, et al., 1994) and the Eastman Chemical Company (Johnston et al., 1994). Findley and Timmons (1995) also report on the use of team based behaviour modification within the construction industry.

A more pro-active use of teams has been the increased use of ergonomic problem solving teams, that is, a team approach to workplace re-design (Kohn and Friend, 1993). Vink et al. (1997) used ergonomic problems solving teams with scaffolders, resulting in a reduction in injuries. However, the most widespread use of ergonomic problem solving teams appears to be within the red meat packing industry.

In the USA, the National Institute for Occupational Safety and Health (NIOSH) conducted research into the effectiveness of team-based approaches to controlling ergonomic hazards (Gjessing, et al. 1994). The research involved three year-long case studies in three different meat packing plants (Gjessing, et al. 1994).

In the first case study, effectiveness was measured using a range of criteria including the number of jobs for which the teams developed solutions, teams members perceptions of the process, employee attitude-pain surveys, reports of cumulative trauma cases and lost days and productions days lost (Gjessing, et al. 1994). This plant experienced a drop in incidence and severity rates and a decrease in reporting of pain among employees (Gjessing, et al. 1994).

In the second case study, effectiveness was measured using measures of team productivity, number of interventions and participant feedback (Gjessing, et al. 1994). This plant experienced a drop in incidence rates, but no significant change in severity rate.

In the third case study, effectiveness was measured using measures of organisational development aspects of the team process including surveys of worker satisfaction and team members' satisfaction. Based upon their findings, the researchers argue that participatory ergonomic teams *appear to be an effective method for generating, implementing, and evaluating improvements in the health and safety of the workplace* (Gjessing, et al. 1994, p.183). The researcher's go on to argue that these types of team

based approaches may *also benefit general management-labour relations* (Gjessing, et al. 1994, p.183).

Overall, this study found that success depended upon a number of factors. These factors included management providing structure and support to the teams, the importance of teams being trained in ergonomic problem solving and team building, teams must comprise personnel who can implement changes and that teams were motivated by early success (LaBar, 1995).

The Finnish Experience

Saarela (1990) examined the use of small groups to improve housekeeping in a Finnish shipyard. Saarela defined a small group as *any group of people operating within the framework of a formal host organisation* (Saarela, 1990, p.149). This study demonstrated the usefulness of participatory approaches, evidenced by improvements in housekeeping, the implementation of 132 countermeasures and a 20% drop in accidents. Eighty-nine percent of participants perceived that the small groups were worthwhile.

The Australian Experience

The aim of this study is to determine the effectiveness of team-based approaches to improving health and safety within Australian industry. Given this context, Australian studies will be examined in more detail to determine the existing state of knowledge.

The Australian experience with team-based approaches to improving health and safety is characterised by rhetoric, with limited research efforts to date. Systematic research efforts have been limited to the automotive industry whilst the Australian Best Practice Demonstration program provides case study evidence that team-based change initiatives - where workplace teams are used to improve health and safety, have proved successful, at least in the short term.

A typical example of the rhetoric is the argument put forward by Blewett and Shaw (1995, p.19), in discussing best practice approaches to occupational health and safety argue that:

Occupational health and safety is a reliable focus for the development of teams because it is personally important to people and because it is a key business process. Teams that take on board the responsibility for

OHS will naturally integrate it into their everyday functioning: that is it becomes an integral management function almost by default.

Caple, (1994), however, has systematically studied the effects of integrating health and safety into natural work groups within the Australian automotive industry (Caple, 1994 and Caple et al., 1997). Caple argues that this approach represents the future for pro-active health and safety management. However, Caple (1994) found that natural work groups primarily focused on local issues with more complex issues being handled by a safety committee. Although the natural work groups experienced a greater feeling of involvement and control, Caple (1994) claims that there is no way to measure the effectiveness of natural work groups and that the benefits are difficult to quantify.

Caple (1994) found that there had been better integration of occupational health and safety (OHS) with productivity and quality using natural work groups and this had led to a culture change.

Using a case study approach, Borys (1995) evaluated the effectiveness of risk improvement teams (RIT's) within a major regional hospital. Borys (1995, p.11) identified five factors associated with the success of these teams:

1. Teams must "fit" the culture of the organisation
2. Teams must "fit" as part of an OHS management system
3. Teams must be provided with the necessary tools and resources to carry out their responsibilities
4. Teams must be trained in team building and OHS skills
5. Teams must have a clear sense of purpose

Borys, (1995) notes that the most immediate benefit gained from the team approach to improving health and safety was the change in culture, and the number of solutions to problems implemented. Also the team-based process brought all levels of staff together to solve shared problems resulting in a renewed interest in health and safety and developed a heightened sense of trust between managers and workers.

In identifying pitfalls associated with this team approach, Borys, (1995) cites a worsening economic environment and a lack of team training as being barriers that prevented the teams from fulfilling their potential. Borys, (1995, p.8) also noted that

unions were sceptical of the move to team based approaches to health and safety because:

The unions felt that the team-based approach de-powered health and safety representatives and was an attempt at divide and rule by the management of the hospital.

This finding by Borys is similar to that of Cohen (1994, p.2) who found that unions believed team-based approaches are a form of *management by stress*.

Borys, (1995) extends the case study to capture the initial establishment of health and safety improvement teams (HSIT) within a small regional university. Borys, (1995) states that the HSIT's fitted within a broader university vision to work in multi-disciplinary teams and argues that *the HSIT's at the University are well positioned to succeed* (Borys, 1995, p.9).

Unlike the hospital team, the HSIT had received training in team work skills, problem solving skills and the process of risk assessment. However, the team reported feeling frustrated by management knocking back ideas that the team put forward - frustration that turned to apathy. Membership changes also impacted upon the team, as did the lack of a management person on the team.

Despite the set-backs, the team claims that more people became aware of the importance of OHS issues, and that OHS was no longer seen as the sole responsibility of the OHS representative.

The Australian Best Practice Demonstration Program - a Commonwealth Government Initiative introduced in 1991 (Caruso, 1997) reveals that many Australian organisations embracing organisational change, often recognised health and safety as an area of focus for cost reduction through improving workplace health and safety. Often, but not exclusively, health and safety improvements became the responsibility of workplace teams - either self-directed work teams or other types of improvement teams. This trend is particularly notable across the machinery, equipment and other manufacturing industries as the following cases illustrate.

Testi (cited in Caruso, 1997) reports on Coates Brothers, a manufacturer of printing inks and surface coatings for the printing and packaging industry. Responsibility for occupational health and safety has been devolved to individual self-managed work teams. The results have been positive including promoting the use of personal protective equipment, training, and a reduction in minor injuries.

Chenhall and Lanfield-Smith (cited in Caruso, 1997) report how Commonwealth Industrial Gases (Cylinders Division) devolved responsibility for occupational health and safety to self-managed work teams. Through a health and safety coordinator in each team, improvements include training programs (for example, safe work practices, hazard identification), modifications to shopfloor layout, inclusion of OHS in benchmarking visits (in particular in relation to the manual handling of cylinders) and attention to housekeeping resulting in limiting employee' exposure to hazards.

Macintosh and Coates (cited in Caruso, 1997) report how the Email Major Appliance Group flattened their organisational structure and introduced work teams in production areas. According to Macintosh and Coates (cited in Caruso, 1997, p.251) *these teams continue to operate in an effective manner, demonstrating a capacity to take responsibility for such issues as safety in the workplace.*

At Sola Optical, a manufacturer of plastic spectacle lenses, OHS is managed to foster greater employee involvement through the establishment of responsible work groups and a team environment that encourages continuous improvement, an emphasis on prevention and the establishment of shopfloor work groups to address OHS issues (O'Neill and Warren cited in Caruso, 1997). Groups are trained to identify hazards, conduct surveys and resolve problems. This approach has resulted in the achievement of a positive safety culture due to initiatives undertaken by shopfloor improvement teams. OHS represents the most visible area of improvement resulting from the best practice project evidenced by reduced workers compensation costs as a proportion of payroll (O'Neill and Warren, cited in Caruso, 1997)

Hardie's Irrigation have introduced cellular manufacturing with cells responsible for OHS. The effective devolution of OHS to the cells had not been fully developed and according to Blewett (cited in Caruso, 1997, p.339):

The plant has a long-standing health and safety committee, but its role and function is not well understood on the factory floor. There remains confusion about the roles of elected OH&S representatives, committee members and team leaders with respect to health and safety.

Health and safety representatives have clear rights and their responsibilities are laid down in the legislation. The health and safety representatives were also unclear about these and tended to be used as safety officers. This may in part be the result of a lack of clarity in the legislation when dealing with team-based organisational structures and the provision of supervision.

In summary, this discussion reveals that organisations are successfully using a range of team types to reduce injuries. However, the findings of Cohen and Ledford (1994) are of particular relevance and significance to this study. Cohen and Ledford, who surveyed group members perceptions of group performance across a range of measures of effectiveness including safety, warn that in relation to self-directed work teams, unless health and safety is a specific target for intervention, then safety is unlikely to improve.

Other issues to emerge from this discussion include opposition to teams by the union movement, a lack of clarity in health and safety legislation in relation to teams and that team success in one department is not a predictor of success in another department within the same organisation.

What is missing from the research is a model that predicts the effectiveness of team based approaches to improving health and safety across industries and team types, and that incorporates standardised measures of effectiveness. The following section is an attempt to find the missing links by reviewing existing theoretical models that attempt to predict team effectiveness.

3.3 Designing Effective Teams

The previous section considered the effectiveness of team based approaches to improving health and safety. The purpose of this section is to take a broader view of the literature and consider and discuss a range of models that attempt to explain how to design effective teams. These models range from those that view the team within its larger organisational and social context, to those that view team effectiveness to be related to the individual team player styles and stages of team development.

3.3.1 Hackman's normative model and orienting framework

Hackman proposes a normative model and orienting framework for effective team work (Hackman, 1987 & 1990). Hackman's models will be discussed in some detail as his work appears frequently in the literature, informing the work of other researchers, for example, Sundstrom et al (1990) and Cohen et al (1996).

Hackman proposed a normative model as part of his research work on behalf of the Office of Naval Research in the United States of America in the mid 1980's (Hackman, 1987). It was at this time that Hackman acknowledged the trend in organisations towards quality circles, autonomous work groups and project teams, suggesting that *groups are indeed becoming a popular way to get things done in organizations* (Hackman, 1987, p.315). Hackman bases his model on previous research on group behaviour and motivation at work.

Acknowledging that teams have a down-side, that is, teams may waste time, enforce norms of low rather than high productivity and at times make bad decisions, Hackman proposes that:

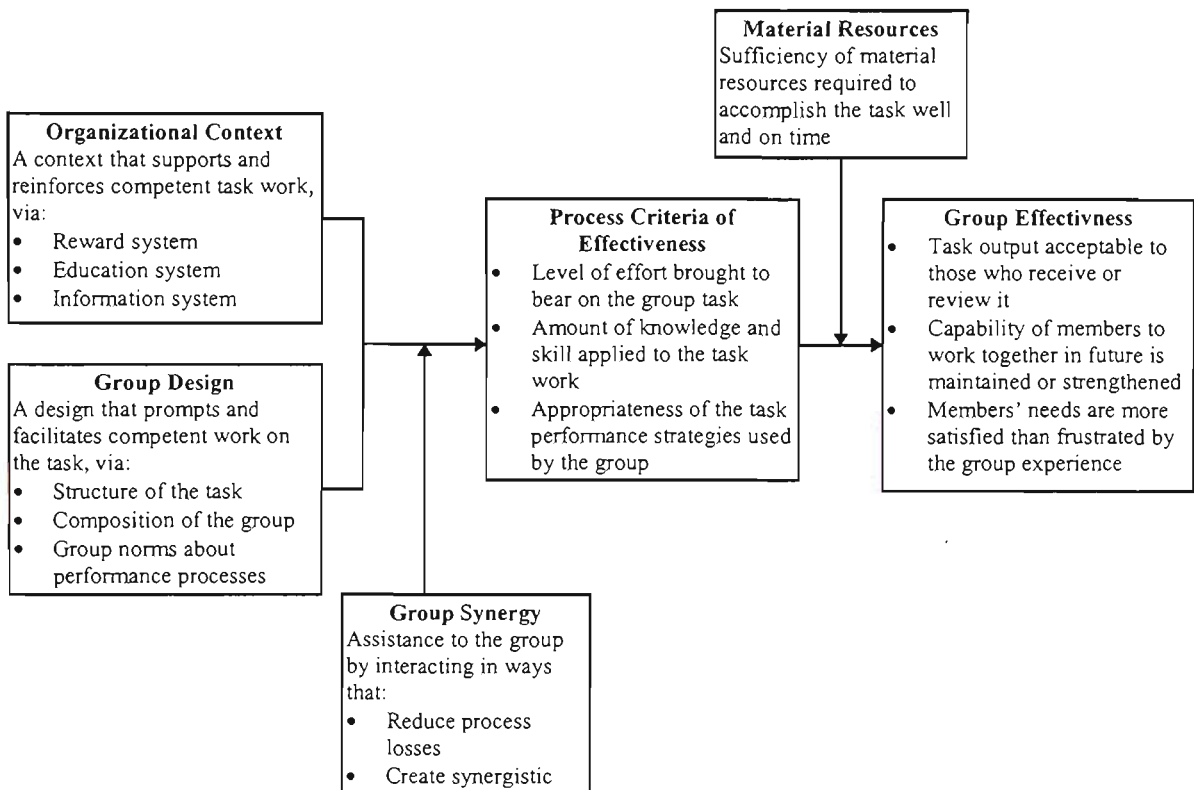
... we must expand what we know about how to design, manage, and consult to work groups in organizations. (Hackman, 1987, p.315).

In recognising the need to know more about effective team design and work, Hackman (1987) also recognised that:

There is currently no well-tested and accepted body of research and theory to guide practitioners in using groups to do work ... (Hackman, 1987, p.315).

Hackman argues that descriptive research on group behaviour that attempts to describe what actually happens in groups has not provided managers with the necessary insights to improve group performance (Hackman, 1987). Therefore, Hackman proposes a normative model that is outcome focused. The model attempts to identify those aspects of the group or its work context that may be manipulated, and that are particularly correlated with team effectiveness (Hackman, 1987). The normative model is shown at figure one below.

Figure 1.
Hackman's Normative Model of Group Effectiveness



Source: Hackman, 1987.

The normative model breaks down into six components of team effectiveness (Hackman, 1987):

1. Group Effectiveness
2. Process Criteria of effectiveness
3. Organizational Context
4. Group Design
5. Group Synergy
6. Material Resources

Group Effectiveness

Hackman uses three criteria to assess group effectiveness (Hackman, 1987, p.323):

1. *The productive output of the work group should meet or exceed the performance standards of the people who receive and/or review the output.*
2. *The social processes used in carrying out the work should maintain or enhance the capability of members to work together on subsequent team tasks.*
3. *The group experience on balance, satisfy rather than frustrate the personal needs of group members.*

These measures of effectiveness focus upon perceptions of effectiveness. They do not provide quantifiable measures of performance in perhaps the way an organisation might envisage. Hackman does this deliberately. He asserts that team tasks in organisations are complex and may not have clear right or wrong answers, and that teams do not *lend themselves to quantitative measures* (Hackman, 1987, p.323).

Process Criteria of Effectiveness

Hackman goes on to argue that the overall effectiveness of teams is the combined function of (Hackman, 1987, p.323):

1. The level of collective group effort.
2. The amount of knowledge and skills of team members.
3. The appropriateness of task performance strategies.

Hackman refers to effort, knowledge and skills and performance strategies as the *process criteria of effectiveness* (Hackman, 1987, p.324). The degree to which teams perform well on these levels will determine the teams overall effectiveness.

However, Hackman cautions that, based upon previous research findings, interventions based only upon improving group processes are likely to fail (Hackman, 1987, p.324).

Organisational Context, Group Design and Group Synergy

Hackman identifies group and context features that impact upon group processes.

Hackman (1987) proposes three group and context variables :

1. Group design, including the structure of the group tasks, composition, and group norms that regulate individual behaviour.
2. Organisational context, including the rewards, education, information, resources available to the group.
3. Group synergy, the interaction between individuals.

Hackman (1987, p.324) claims that:

Group members are most likely to work hard on their task if (1) the task itself is motivationally engaging, (2) the organizational reward system provides challenging performance objectives and reinforces their achievement, and (3) interaction among members minimizes "social loafing" and instead promotes a shared commitment among members to the team and its work.

In relation to the design of the group, Hackman (1987) claims that teams will work hard when the task requires the use of relatively high skill levels, the work is meaningful with a visible outcome, and that those outcomes have significant consequence for other people. Teams must also have autonomy for decision making and be responsible for their outcomes. Teams require feedback on how the team is performing.

Hackman argues that a well composed team will exhibit four characteristics (Hackman, 1987):

1. Team members have high task-relevant expertise.
2. A small team just large enough to carry out the work.
3. Team members have moderate interpersonal skills.
4. There is diversity among team members.

Organisations are able to build upon and motivate a well designed team by providing challenging and specific performance objectives, recognising and rewarding excellent performance by the team, not individual performance (Hackman, 1987). Although Hackman distinguishes between team design and organisational context, it is argued that in practice it may be difficult to separate the two, that is, The design of the team and its task is also dependent upon the organisational context within which the team exists.

Hackman also recognises that teams may need access to educational resources including technical expertise and training, and that this expertise *must exist somewhere in the organization* (Hackman, 1987, p.328).

Further, to enhance team performance strategies, the organisation should (Hackman, 1987):

1. Specify and clarify task requirements and task parameters.
2. Make available for use, material resources.
3. Specify who will receive, review and use the product of the teams work and the standard/s against which the work will be reviewed.

Hackman's (1987) third and final group and context variable is team synergy.

Hackman argues that teams need to coordinate team member activities and maintain motivation to avoid what Hackman terms *process losses* (Hackman, 1987, p.326).

These losses may be greater when teams are larger, thus creating more opportunity for *social loafing* (Hackman, 1987, p.326).

Synergy results from shared commitment based upon individuals valuing their membership of the team (Hackman, 1987). In fact Hackman (1987, p328) asserts that:

A group that orients itself to collective learning and whose members share what is learned with each other should be far better able to exploit the educational resources of an organization ...

Material Resources

The final building block to Hackman's model is material resources required to do the work. That is, teams need tools, equipment, space, raw materials, money and human resources to perform effectively (Hackman, 1987).

Hackman and a group of researchers went on to study twenty-seven diverse teams ranging from top management teams to performing groups (Hackman, 1990, p.xvii). Building upon Hackman's normative model, the researchers used an orienting framework identifying points of leverage for creating conditions that enhance performance. The orienting framework is shown at table one.

Table 1.
Points of Leverage for Creating Conditions That Enhance Group Task Performance

<i>Points of Leverage</i>			
Process Criteria of effectiveness	Group Structure	Organizational Context	Coaching and Consultation
Ample Effort	Motivational structure of group task	Organizational reward system	Remedying coordination problems and building group commitment
Sufficient knowledge and skill	Group composition	Organizational education system	Remedying inappropriate “weighting” of member inputs and fostering cross-training
Task-appropriate performance strategies	Group norms that regulate member behaviour and foster scanning and planning	Organizational information system	Remedying implementation problems and fostering creativity in strategy development

Source: Hackman, 1990

The researchers found what they called *cross-cutting themes* that they had not anticipated (Hackman, 1990, p.479). A summary of these themes is shown in table two.

Table 2.
Cross-cutting Themes of Group Effectiveness

Theme	Explanation
Time and Rhythm	Absent, fuzzy or changing deadlines had a negative affect on team performance.
Self-Fuelling Spirals	Groups that started well performed even better as time passed. Those who did not found that their problems compounded.
Authority	A stable authority structure is extremely important. Changes in leadership led to teams encountering problems. The best time for intervention by authority figures is at the beginning of a group’s life.
Work Content	The <i>stuff</i> teams work with. The content of a group’s work shapes the members lives and their interaction.

Source: Hackman, 1990

In summary, Hackman, through the normative model and orienting framework, argues that the design of the group must be appropriate, as well as the organisational context for group work. Hackman claims that:

Excellent group performance requires both a good design for the team and a supportive organisational context (Hackman, 1987, p.331).

3.3.2 Shea and Guzzo's determinants of work group effectiveness

In contrast to Hackman's normative model (1987), Shea and Guzzo (1987) propose a model of work group effectiveness that identifies only three factors that determine group effectiveness:

1. Task interdependence
2. Outcome interdependence
3. Potency

The authors claim, similar to Hackman (1987), that:

... we know far too little about managing groups , partly because behavioural-science research and theory about groups and group task effectiveness have not kept pace with the increasing importance of group performance (Shea and Guzzo, 1987, p.25)

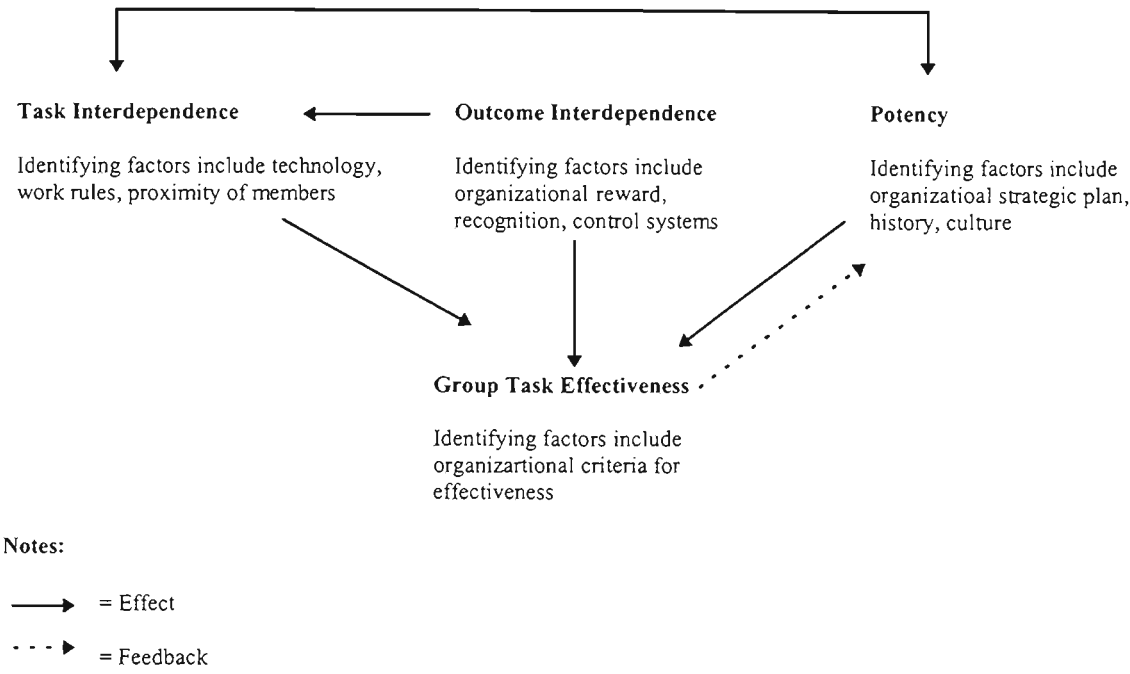
Shea and Guzzo, (1987) go on to condemn laboratory research into group effectiveness and past work on group dynamics, claiming that the research cannot be generalised to real-world, real-time group effectiveness (Guzzo and Shea, 1987, p.5).

The authors define effective as being:

... the production of designated products or the delivery of contracted services, per specification (Shea and Guzzo, 1987, p.25).

By combining their own review of the literature with their experience, the authors have proposed a model of work group effectiveness, this model is shown at figure two.

Figure 2.
A Model of Determinants of Work Group Effectiveness



Source: Shea & Guzzo, 1987

Task interdependence refers to the interaction of group members as they go about completing a task. Outcome interdependence relates to the rewards the group members share for completing a task - rewards normally bestowed upon the group by a person outside the group, for example a supervisor or senior manager. Potency relates to a belief by the group that they have what it takes to succeed, for example, that the group has resources (access to money, time and human resources) and feedback on performance (Shea and Guzzo, 1987).

The authors designed a study to test their theory. The study, undertaken in a national retail corporation with 800 outlets generally supported the theory of the model. In particular the research found that:

... potency is a contemporaneous, immediate determinant of group's effectiveness (Shea and Guzzo, 1987, p.30).

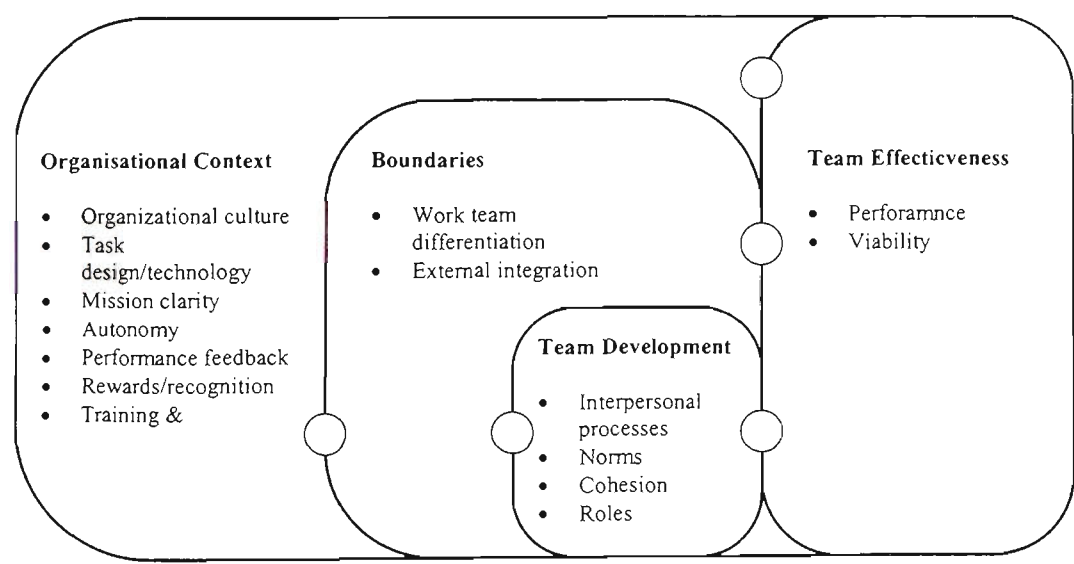
The study also revealed that the group's potency increased with more involvement in decision making and the patterns of interaction established by the group (Shea and Guzzo, 1987).

In summary, Shea and Guzzo's (1987) model, and their subsequent study to test the model, reveals that fundamentally, groups are effective when they believe they will be effective. Shea and Guzzo refer to this a *potency* (Shea and Guzzo, 1987). However, potency is the other side of the organisational context and material resources coin advocated by Hackman (1987). Shea and Guzzo also offer a more limited definition of effectiveness to that offered by Hackman (1987), and do not take into account the worth of group work to the individual or group.

3.3.3 Sundstrom et al's ecological model

The third model of effective team design is proposed by Sundstrom et al., (1990). The authors adopt an ecological approach to analyse the factors associated with the effectiveness of work teams (Sundstrom et al., 1990). Figure 3 shows the ecological framework for analysing work team effectiveness as proposed by Sundstrom et al. (1990).

Figure 3.
Sundstrom et al's Ecological Model



Source: Sundstrom et al., 1990

The ecological perspective is based upon the premise that *work teams can best be understood in relation to external surroundings and internal processes* (Sundstrom et al. 1990, p121). Drawing upon current research, theory and applied literature on teams, the ecological model proposes five variables (Sundstrom et al., 1990):

1. Organizational Context
2. Boundaries
3. Team Development
4. Team Effectiveness
5. Interrelationships

Drawing upon the work of Hackman (1987) and others, Sundstrom et al. (1990) identify features of the organisational environment (external to the team) that are associated with team effectiveness including the reward systems and training resources.

However, in keeping with the ecological view, Sundstrom et al. (1990) identifies boundaries that both separate and link teams within their organisation. By boundaries, Sundstrom et al. (1990, p.121) are distinguishing features that:

- *Differentiate a work unit from others*
- *Pose real or symbolic barriers to access or transfer of information, goods, or people*
- *Serve as points of external exchange with other teams, customers, peers, competitors, or other entities*

Boundaries assist teams to maintain their identities (Sundstrom et al., 1990). The inclusion of boundaries within the ecological model distinguishes this model from the normative model of Hackman (1987).

Sundstrom et al. (1990) identify team norms and roles and temporal patterns that may be related to team effectiveness within the category team development. Temporal patterns of team development have been studied by other researchers Tuckman (in Parker, 1990) and Gersick (1988) and are discussed more fully in the following sections of this paper.

Team effectiveness is characterised within the ecological model by performance and viability (Sundstrom et al., 1990). Effectiveness is defined as (Sundstrom, et al. , 1990, p.122):

Team viability: At a minimum, this entails members' satisfaction, participation, and willingness to continue working together. A more demanding definition might add cohesion, intermember coordination,

mature communication and problem-solving - all traditionally identified with team maturity.

Performance means acceptability of output to customers within or outside the organization who receive team products, services, information, decisions, or performance events ...

This expanded definition of effectiveness is consistent with that of Hackman (1987) and more comprehensive and inclusive than definitions such as the *production of designated products or services per specification* (Shea and Guzzo quoted in Sundstrom et al., 1990, p.122).

The final component of the ecological model is interrelationships. Sundstrom et al. (1990) claim to be deliberately vague about *causal and temporal dynamics* (Sundstrom et al., 1990, p.122). They argue that team effectiveness is more a process than an end state - deliberately departing from the input-process-output model as did Hackman, (1987). The ecological model shows adjacent parts of the model linked by circular symbols that attempt to illustrate *reciprocal interdependence* (Sundstrom et al. 1990, p.122).

In summary, the ecological model incorporates many aspects of the normative model proposed by Hackman (1987). The strength of the ecological model is that it clearly locates teams within an organisational context and identifies the reciprocal nature of the boundaries between organisational context, team development and team effectiveness.

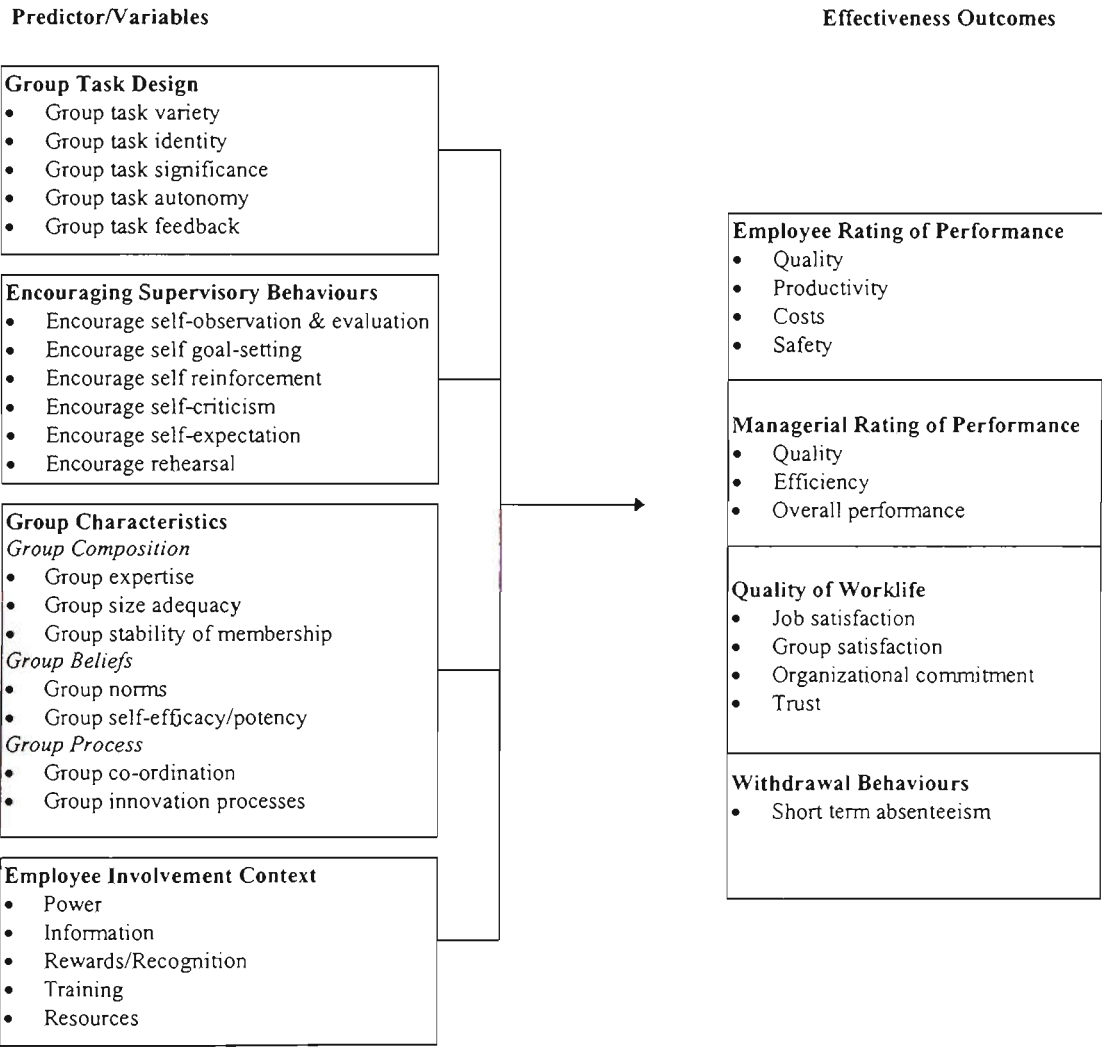
3.3.4 Cohen et al's predictive model

The fourth model of effective team work that is under consideration here is that proposed Cohen et al (1996). Cohen et al's (1996) predictive model of self-managing work team effectiveness is based upon theoretical perspective's and incorporates four categories of variables (Cohen et al., 1996, p1):

1. Group task design
2. Encouraging supervisor behaviours
3. Group characteristics
4. Employee involvement context

These variables lead to effectiveness in relation to performance effectiveness, employee attitudes about quality of work life and employee behaviour (Cohen et al., 1996). The model is shown at figure four.

Figure 4.
A Predictive Model of Self-managing Work Team Effectiveness



Source: Cohen et al., 1996

Cohen et al. (1996) contend that research has been lacking that connects various research perspective’s into an integrated framework. The authors reviewed theories that emphasise one predictor variables of team effectiveness, for example, sociotechnical theory, work design theory and participative management theory. The authors have also considered the models that have arisen from these theories including those models proposed by Hackman (1987), Shea and Guzzo and Sundstrom et al.(1990). The authors contend that the multiple predictor variables in these models overlap.

The predicative model draws upon research undertaken in a USA telecommunications company in 1994 where Cohen et al. (1996) found that:

... a practitioner interested in designing effective self-managing work teams should first focus on enhancing the context for employee involvement (Cohen et al., 1990, p.17).

The authors go on to conclude that predictors of team effectiveness may vary depending upon the type of work the team was undertaking (Cohen et al., 1996).

In summary, Cohen et al. (1996) have integrated many of the previous models of team effectiveness into an integrated model.

3.3.5 Dunphy and Bryant's team attribute development model

Dunphy and Bryant (1996) used a case study approach within Australian manufacturing companies to study the contribution of teams to organisational performance. The authors argue that there is:

... little or no research which links the introduction of teams to the attainment of strategic objectives (Dunphy & Bryant, 1996, p.3).

In particular, the authors argue that the costs of introducing and maintaining teams have been ignored (Dunphy & Bryant, 1996).

The authors studied multiskilled, self-managed and self-led teams ability to contribute to performance in terms of innovation, value and cost. The authors argue that few studies have measured the link between team design and performance (Dunphy & Bryant, 1996).

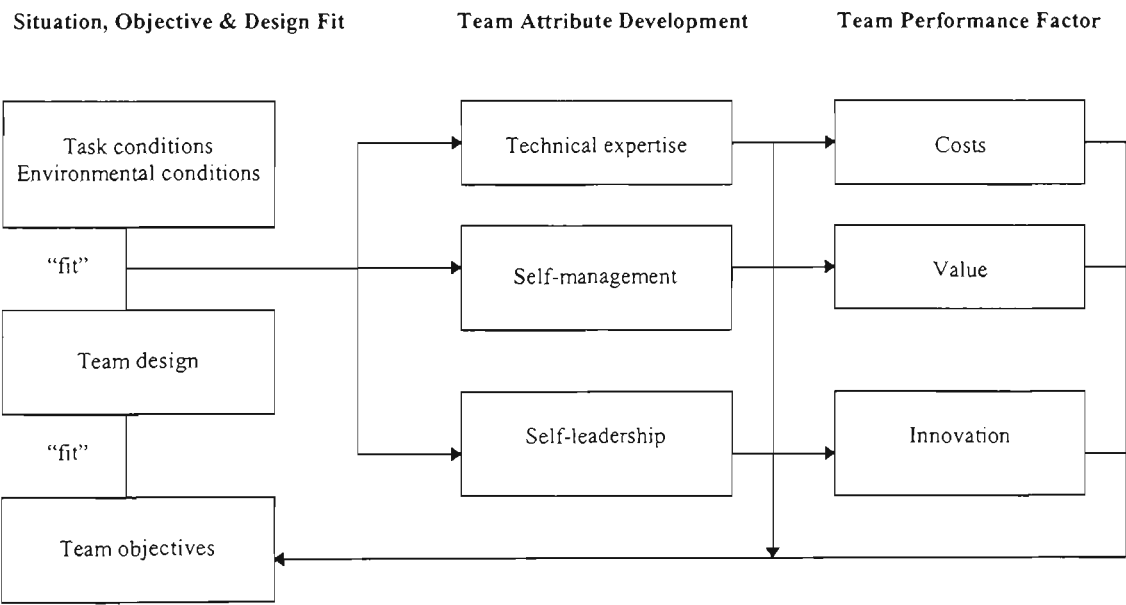
In studying self-managing teams, the authors note that:

Skills such as planning, coordinating, personnel functions, and quality management, health and safety, and boundary management were previously the domain of the traditional supervisor or middle manager. They are increasingly becoming the domain of the empowered team (Dunphy & Bryant, 1996, p.8).

The authors found that multiskilled teams contribute most to cost, self-managing teams contribute most to value, with self-led teams contributing most to innovation.

Based upon their research, the authors developed a team attribute development model as shown in figure five. The model assumes a ‘fit’ exists between the task and environmental conditions, team design and team objectives. The model argues for the rationalisation of team training and development costs by prioritising the development of attributes which will contribute most to organisational performance. In effect, the model is a team development model that allows teams to be progressively trained in the areas of technical expertise, self-management and self leadership, culminating in team performance measured by cost, value and innovation (Dunphy & Bryant, 1996, p.14).

Figure 5.
The Dunphy and Bryant Team Attribute and Development Model



Source: Dunphy & Bryant, 1996

3.3.6 Katzenbach and Smith's team basics

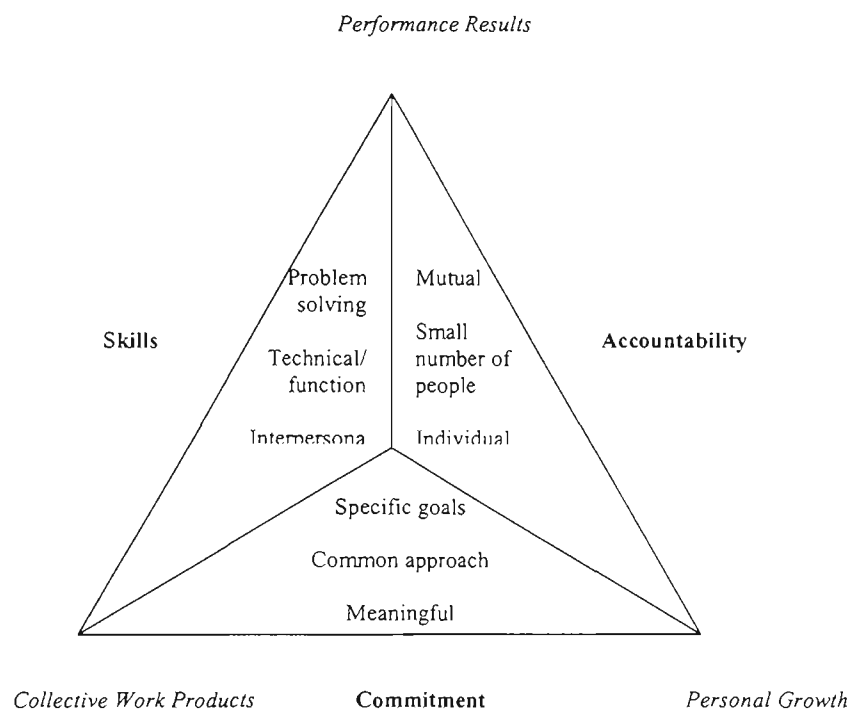
Katzenbach and Smith (1993) also propose a model of team effectiveness, built upon extensive experience working with real teams, the authors suggest that:

If there is new insight to be derived from the solid base of common sense about teams, it is the strange paradox of application. Many

people simply do not apply what they already know about teams in any disciplined way, and thereby miss the team performance potential before them (Katzenbach and Smith, 1993, p.2).

The team basics model of Katzenbach and Smith, (1993) is shown below in figure six.

Figure 6.
Katzenbach and Smith's Team Basics Model



Source: Katzenbach & Smith, 1993

The team basics models requires teams to be small in number, have complementary skills, be committed to a common purpose and performance goals, be committed to a common approach and share mutual accountability (Katzenbach and Smith, 1993).

Katzenbach and Smith (1993) claim that the size of the team is important. They argue that a group larger than 25 cannot operate effectively as a real team due to the inability of a group of such size to develop the common purpose, goals and approach of a real team (Katzenbach and Smith, 1993,). The authors have also found that teams require complimentary skills that fall into three categories (Katzenbach and Smith, 1993, p.47):

1. Technical or functional expertise

- 2. Problem solving and decision making skills
- 3. Interpersonal skills

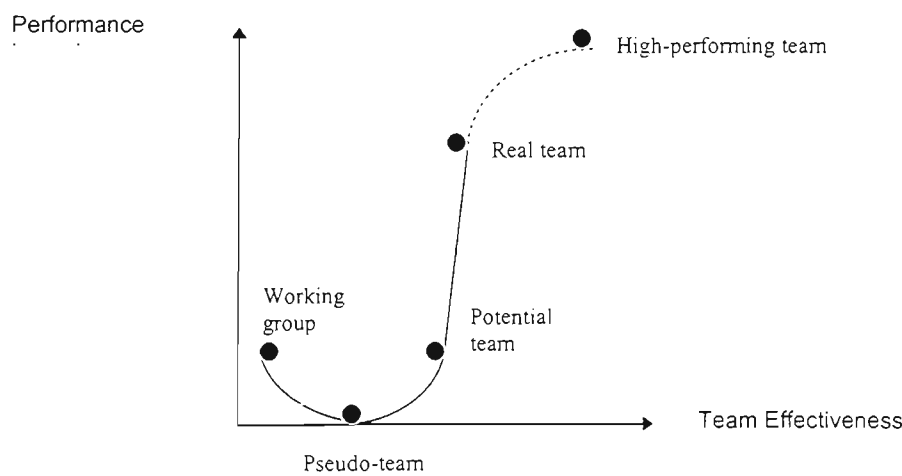
However, the authors stress that it is an error to over emphasise the need to achieve the right mix of team skills, even though *the popular literature on teams ... stresses skill mix as a prerequisite to selection* (Katzenbach and Smith, 1993, p.48). According to the authors, their research found that no team had the right mix of necessary skills to start with, but that over time, the team provided a vehicle for progressively gaining the skills required (Katzenbach and Smith, 1993). Forthcoming sections discuss team effectiveness based upon obtaining the right mix of personal skills.

Katzenbach and Smith (1993, p.49) argue that a team's purpose and performance are related and that they have *not found a real team without both* as follows:

- 1. A common, meaningful purpose sets the tone and aspiration
- 2. Specific performance goals are an integral part of the purpose

The authors propose a team performance curve that describes how over time, there is a progression from a working group to a high performance team. The team performance curve is shown at figure 7 and explained in table 3.

Figure 7.
The Team Performance Curve



Source: Adapted from Katzenbach & Smith, 1993

Table 3.
Explanation of the Team Performance Curve

1. Working group	No significant incremental performance need
2. Pseudo-team	Has not focused on collective performance and is not really trying to achieve it
3. Potential team	Really is trying to improve its performance impact
4. Real team	Small number of people who are equally committed to a common purpose, goals, and working approach for which they hold themselves mutually accountable
5. High-performance team	Meets all the conditions of a real team and has members who are also deeply committed to one another's personal growth and success

Source: Katzenbach & Smith, 1993

3.3.7 Parker's twelve characteristics of an effective team

Parker, (1990) proposes that there are twelve characteristics of an effective team. Parker draws on past research, in particular the work of Elton Mayo and the Hawthorne Studies.

According to Parker, (1990, p.18):

Mayo concluded that it was a major responsibility of management to foster the conditions that promote effective teams.

Parker also draws upon the work of Kurt Lewin whose work led to a field of study known as group dynamics (Parker, 1990, p.18).

According to Parker, (1990, p.18):

In Lewin's view, a team is an open social system with a series of forces or vectors applied to it from two sides. If the forces are equal, the team will remain in a state of equilibrium - it will not change. However, if the forces on one side increase or decrease, the balance point will change.

In summarising Lewin's work, Parker describes this process of bringing about change as one of unfreezing, moving (subscribing to new team norms, values and behaviours) and finally refreezing - a point in time where the new norms are supported (Parker,

1990, p.19). Parker describes this technique as devised by Lewin as force field analysis and asserts that *force field analysis is still used today as a technique for improving the effectiveness of teams* (Parker, 1990, p.19).

Parker also draws upon the work of McGregor. According to Parker, McGregor developed a set of assumptions about motivation that McGregor labelled *Theory X and Theory Y* (Parker, 1990, p.19). McGregor also produced lists of effective and ineffective management teams (Parker, 1990). According to Parker, (1990, p.24) McGregor asserts that *effective teams are impossible within a Theory X management style*. A Theory X management style holds that workers are lazy and irresponsible and the role of management is to direct and discipline workers (Baron, 1986). In contrast, Theory Y holds that workers are capable of working productively and accepting responsibility (Baron, 1986).

Parker also draws upon the work of Renis Likert who, according to Parker (1990, p.24) discovered that the most effective managers were *employee centred*.

Finally Parker draws upon the work of psychologist Chris Argyris (Parker, 1990, p.28). According to Parker (1990, p.28), Argyris *focused his attention on the personal development of the individual in the context of the organization*.

On the basis of this past research, Parker proposes a new model of effectiveness. The 12 characteristics of an effective team are shown in table four below.

Table 4.
Parker’s Twelve Characteristics of an Effective Team

1. Clear Purpose	The vision, mission, goal, or task of the team has been defined and is now accepted by every one. There is an action plan.
2. Informality	The climate tends to be informal, comfortable, and relaxed. There are no obvious tensions or signs of boredom.
3. Participation	There is much discussion and everyone is encouraged to participate.
4. Listening	The members use effective listening techniques such as questioning, paraphrasing, and summarizing to get out ideas.
5. Civilized Disagreement	There is disagreement, but the team is comfortable with this and shows no signs of avoiding, smoothing over or suppressing conflict.
6. Consensus Decisions	For important decisions, the goal is substantial but not necessarily unanimous agreement through open discussion of everyone's ideas, avoidance of formal voting, or easy compromises
7. Open Communication	Team members feel free to express their feelings on the tasks as well as on the group's operation. There are few hidden agendas. Communication takes place outside of meetings.
8. Clear Roles and Work Assignments	There are clear expectations about the roles played by each team member. When action is taken, clear assignments are made, accepted, and carried out. Work is fairly distributed among team members.
9. Shared Leadership	While the team has a formal leader, leadership functions shift from time to time depending upon the circumstances, the needs of the group, and the skills of the members. The formal leader models the appropriate behaviour and helps establish positive norms.
10. External Relations	The team spends time developing key outside relationships, mobilizing resources, and building credibility with important players in other parts of the organizations.
11. Style Diversity	The team has a broad spectrum of team-player types including members who emphasize attention to task, goal setting, focus on process, and questions about how the team is functioning.
12. Self-Assessment	Periodically, the team stops to examine how well it is functioning and what may be interfering with its effectiveness.

Source: Parker, 1990

3.3.8 Belbin's nine team member roles

Belbin (1981), in studying high performing groups, explores the role of individual team player’s, identifying the following factors with group success (Belbin, 1981, p.94):

... the attribute of the person in the Chair, the existence of a good Plant, a spread in mental abilities, a spread also in personal attributes laying the foundation for different team-role capabilities, a distribution in the responsibilities of members to match their capabilities, and finally, an adjustment to the realization of imbalance.

Belbin (1993) goes on to identify nine team roles as shown in table five below.

Table 5.
Belbin’s Nine Team Roles

Roles and descriptions - team role contribution	Allowable weaknesses
Plant: Creative, imaginative, unorthodox. Solves difficult problems	Ignores details. Too preoccupied to communicate effectively.
Resource investigator: Extrovert, enthusiastic, communicative. Explores opportunities. Develops contacts.	Overoptimistic. Loses interest once initial enthusiasm has passed.
Co-ordinator: Mature, confident, a good chairperson. Clarifies goals, promotes decision making, delegates well.	Can be seen as manipulative. Delegates personal work.
Shaper: Challenging, dynamic, thrives on pressure. Has the drive and courage to overcome obstacles.	Can provoke others. Hurts people's feelings.
Monitor evaluator: Sober, strategic and discerning. Sees all options. Judges accurately.	Lacks drive and ability to inspire others. Overly critical.
Teamworker: Co-operative, mild, perceptive and diplomatic. Listens, builds, averts friction, calms the waters.	Indecisive in crunch situations. Can be easily influenced.
Implementer: Disciplined, reliable, conservative and efficient. Turns ideas into practical actions.	Somewhat inflexible. Slow to respond to new possibilities.
Completer: Painstaking, conscientious, anxious. Searches out errors and omissions. Delivers on time.	Inclined to worry unduly. Reluctant to delegate. Can be a nit-picker.
Specialist: Single-minded, self-starting, dedicated. Provides knowledge and skills in rare supply.	Contributes on only a narrow front. Dwells on technicalities. Overlooks the 'big picture'.

Source: Belbin, 1993

Authors such as Katzenbach and Smith (1993) and Syer and Connolly (1996) have been critical of the narrow, recipe type approach adopted by Belbin. Katzenbach and Smith (1993), in referring to popular literature on teams that stresses a mix of skills in a way that Belbin does, found no evidence of such a mix of skills or *recipe* in their research work, Katzenbach and Smith (1993, p.48), argue that teams learn to acquire the necessary skills over time.

Syer and Connolly (1996) are also critical of Belbin's categories, preferring to see the team as a system. These authors claim that:

The problem is that they impose a structure on a dynamic process which is in fact much more complex, fluid and fraught with potential. This gives a false impression of control (Syer and Connolly, 1996, p.7&8).

Syer and Connolly (1996, p.8) assert that teams can work effectively with their chosen individuals, and that success of the team is related to the operation of effective team processes over time. These authors offer a systems approach to team development and

effectiveness (Syer and Connolly, 1996), and their work is considered in more detail in a forthcoming section.

In more recent work Belbin (1996, viii) has recognised that:

No less important than the team was the link between the team and the structure of the company. Even a good team cannot fulfil itself in an unsatisfactory environment.

This shift in thinking reflects the more traditional thinking on team effectiveness, for example, Hackman, (1987) and Cohen et al., (1996) as previously discussed.

However, Belbin, does not dispense with the idea of team roles in presenting the five basic principles of team work:

- 1. A good team has to be selected.
- 2. Placement of players - particular players are right for particular positions.
- 3. An emphasis on specialisation - a requirement to be versatile.
- 4. A good team contains players who know how to combine well and respond to the demands of the current situation
- 5. A good team develops its capacity for autonomy on the basis of the strategies and mutual understanding that are developed before team work begins.

3.3.9 Parker’s four team-player styles

Parker (1990, p.164) also recognises that team player styles may be related to effective team work, proposing four team player styles. These are summarised in table six.

Table 6.
Parker’s Four Team-Player Styles

Contributor	Task oriented
Collaborator	Goal oriented
Communicator	Process oriented
Challenger	Question oriented

Source: Parker, 1990

3.3.10 Tuckman's four stages of team development

Tuckman's group development model synthesised the literature on group dynamics and is a model that is frequently cited (Gersick, 1988). Tuckman's model proposes that all groups go through the stages of forming, storming, norming and performing, to which Tuckman and Jensen added adjourning in 1977 (Gersick, 1988).

Bales and Strodtbeck, in studying group development from the perspective of phases in group problem solving propose three phases that a group moves through in solving problems: orientation, evaluation and control (Gersick, 1988).

Both models are criticised on the basis that groups may move through iterative cycles rather than develop in a linear order (Gersick, 1988).

3.3.11 Gersick's mid-point transition model

Gersick undertook a study with the aim of generating new theory on team development (Gersick, 1988). The study allowed Gersick to propose a midpoint transition model of team development. According to Gersick 1988, p.17):

... the proposed model described groups' development as punctuated equilibrium. Phase 1, the first half of groups calendar time, is an initial period of inertial movement whose direction is set by the end of the groups' first meeting. At the midpoint of their allotted calendar time, groups undergo a transition, which sets a revised direction for phase 2, a second period of inertial movement.

The models of group development provide yet another layer to the complex picture of predictors of effective teamwork.

3.3.12 Syer and Connolly's systems model

Syer and Connolly (1996) who, in the previous section, were critical of Belbin (1993) and the categorisation of team roles at work, level the same criticism at traditional models of team development like forming, storming, norming and performing (Syer and Connolly, 1996, p.7). These authors believe that the traditional models impose

structure on dynamic processes (Syer and Connolly, 1996). Syer and Connolly instead draw upon systems theory to explain team development and effectiveness stating:

The systems approach differs most obviously from traditional methods in its concept of circular causality. In the non-systems view, every event is caused by preceeding events ... many phenomena do not fit the linear method (Syer and Connolly, 1996, p.11).

Syer and Connolly (1996) assert that teams operate in an open systems environment, that is, an environment where the organisation is interacting with and receiving feedback from its customers. These system boundaries are important for teams as *team members can only gauge their customers' requirements by meeting and interacting with them at the boundary between them* (Syer and Connolly, 1996, p.14).

The authors also propose a relationship between fours systems laws and teams, these laws are given in table seven.

Table 7.
Four Systems Laws

The composition law	This defines the concept of synergy, stating that the whole is greater than the sum of its parts. Elements of the system relate to each other, showing attributes, qualities and performance that can only be observed in terms of those relationships. The relationships generate energy that is otherwise only a potential.
The comprehension law	An examination of its parts or subsystems is not enough to understand an entire system. Systems are dynamic. If the parts or subsystems are taken out of relationship with each other, they will no longer demonstrate the qualities of the relationship and will therefore not explain their attributes as part of the system.
The decomposition law	The part is more than a fraction of the whole: the components of a system have an existence of their own. Put them in another system and they may demonstrate qualities that were not evident in the previous system. In this respect, team members have qualities and skills not evoked in the context of the team and may perform very differently elsewhere.
The complexity law	When we view something from various perspective's it is often seen differently. The team experience does not look the same from different aspects and the system cannot be envisaged completely from within.

Source: Syer & Connolly, 1996

The authors also discuss systems as applied to teams in relation to inputs, outputs and energy transfers (Syer and Connolly, 1996), presumably this approach to team development distinguish itself from prior attempts to model team effectiveness in this way (Hackman, 1987) by making explicit the idea of circular causality in preference to linear causality. The authors state that (Syer and Connolly, 1996, p.16):

When a system approach is applied to teamwork, performance is the 'output' of the teams' process. The way in which the teams' input is

quickly transformed by this process determines the success of the system. The more quickly the team solves the problem and puts in place a permanent corrective action, the more effectively will the team system perform.

For the team system to be effective, Syer and Connolly (1996) argue that teams need feedback:

The critical link between the teams' structure and its process is found in feedback loops. Feedback loops feed information from output back to input - from a teams' past performance into its future performance. A team gradually establishes patterns of operation that transform the inputs to its system into desirable outputs. Feedback ensures that success is constantly repeated (Syer and Connolly, 1996, p.25).

Finally, the authors argue that by maximising team process, team performance will also be maximised, and this will be achieved by taking into account the whole picture or the ecology of the whole system - consistent with earlier work by Sundstrom et al (1990), (Syer and Connolly, 1996, p.29). In arguing that process determines structure and not the reverse, team performance may be modified through feedback on team performance overtime on what the authors refer to as the four CORE characteristics of team process, (Syer and Connolly, 1996, p.29&30).:

1. Consistent in its performance over time.
2. Optimal for the tasks it has to perform.
3. Robust to all the uncontrollable and unpredictable events it encounters.
4. Evolving as it continuously discovers its full potential.

3.4 Summary

In summary, this literature review has found that although team-based approaches to work are not new, there has been a re-surgence of interest in teamwork during the 1990's. Health and safety is currently riding this wave of interest in teamwork and using team-based approaches to improve health and safety in the workplace.

This literature review reveals two short-comings in relation to the research into the effectiveness of team-based approaches to improving health and safety. Firstly, there

is a dearth of research. Most of the research is anecdotal with the majority emerging over the last four years; that is, there are no longitudinal studies. Secondly, there are no agreed measures of 'effectiveness'. This situation applies not only to health and safety but to team work in general.

Team-based approaches to improving health and safety have been used to solve ergonomic problems, modify employee behaviour and generally improve health and safety at work.

This literature review found that team-based approaches are generally effective at improving health and safety. A variety of improvement measures support this claim including the number of improvements implemented in the work place and reductions in injury and illness rates and costs.

The literature reveals that team-based approaches to improving health and safety have encountered difficulties, these include union resistance to teams, variations in team effectiveness between teams in the one organisation and confusion between the role of health and safety representatives, committees and teams.

There are a range of theoretical models that attempt to predict team effectiveness ranging from models that take account of broad organisational factors that support effective team work to those that focus on achieving the right mix of individual team-player styles.

In synthesising these models, six common categories of variables related to team effectiveness emerge:

1. Organisational Context
2. Team Design
3. Team Process
4. Team Effectiveness
5. Team Player Styles
6. Temporal Factors

These categories will be used to inform this study into the effectiveness of improving team-based approaches to improving health and safety.

4.0 Methodology

The methodology used for this project involved an extensive literature review and case studies of two team types representing two industries.

Ethics

Approval to conduct this research was gained from the University of Ballarat Human Research and Ethics Committee.

4.1 Literature Review

The literature review for this project was based on an extensive review of a range of sources including CDROM databases, on-line databases, library catalogues and the internet. Information sources were accessed via the E. J. Barker library at the University of Ballarat, the Victoria University of Technology (Footscray campus) library and the VIOSH Australia information room within the University of Ballarat.

A range of keywords or phrases were used including *safety improvement teams, safety and teams, quality and management and safety, teamwork, teams, groups, effectiveness, measurement*. The most successful words for locating information were *safety and teams, teams and groups*. The keyword *group* often cross-referenced to articles on teams. Literature on team-based approaches to work was more prevalent than literature on team-based approaches to health and safety. In particular, the business world's current interest in re-structuring organisations around team-based approaches is being well fed with a steady stream of popular management texts on "how to do teams".

Following is a list of CDROM and on-line database sources of information searched, with successful sources underlined and italicised.

CDROM

- American Business Index (ABI - Inform)
- *OSHROM (including HSELINE, CISDOC, NISOHTIC)*

- CCINFO (CISILO, Canada, Canadian Studies)
- Australian Business Index (ABIX)
- AIMMAT
- APAIS
- AIRL
- Psychlit

On-line Databases

- Expanded Academic ASAP (SearchBank)

- FirstSearch

Business and Economics:

- Worldcat
- Business Periodicals
- Index (popular business magazines)
- Article 1st
- WiBus Abstracts
- Sociological Abstracts

Social Sciences:

- Econlist
- PsychFirst
- SocSciInd

Conferences and Papers:

- Papers Presented

New and Current Events:

- NewAbstracts

Education:

- ERIC

Engineering and Technology:

- AppliSciIndex

General and Reference:

- Dissertation Abstracts
- EBSGOMag

Also:

- Public Affairs law
- GPO
- Index Legal Periodicals
- PAIS Decade

4.2 Case Studies

The literature review revealed a dearth of research in the area of team work in general (Hackman, 1987) and also specifically in relation to team work and health and safety (Cohen & Ledford, 1994). This lack of research into the effectiveness of team-based approaches to improving health and safety points to a need for more exploratory research to identify the variables involved.

A case study approach was chosen for this exploratory research project as a first step towards closing the research gap. Hartley (1994 pp.208-209) defines a case study as:

" ... a detailed investigation ... of one or more organizations, or groups within organizations, with a view to providing an analysis of the context and processes involved in the phenomenon under study. The phenomenon is not isolated from its context ... but is of interest precisely because it is in relation to its context. "

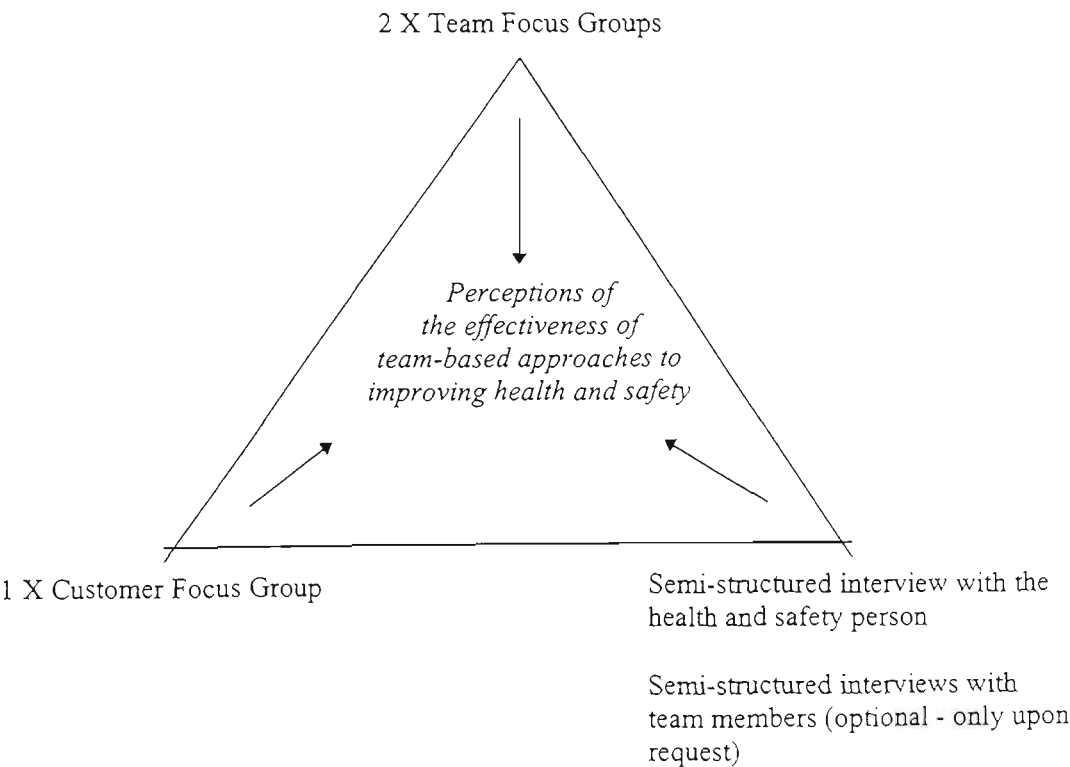
Yin (1994, p.13) defines a case study as an empirical inquiry that *investigates a contemporary phenomenon within its real-life context* and that this inquiry *benefits from the prior development of theoretical propositions to guide data collection and analysis*.

Hartley (1994) argues that case studies are better able to probe areas of emergent theory and are capable of generating hypotheses and building theory.

The case study, as a research strategy, is appropriate for this study. Team-based approaches to improving health and safety represent a *contemporary phenomenon* and these teams exist within organisations - *real-life context*. Further, much of the literature on team work draws heavily upon the case study approach for gaining insight into the effectiveness of team based approaches to both work and health and safety, for example, research undertaken to investigate team work in Australian companies (Austen, 1995) and an investigation into participatory ergonomic interventions in USA meat packing plants (Gjessing et al, 1994).

Case study data was collected through a combination of focus groups and semi-structured interviews. Perceptions of the effectiveness of the team-based approach to improving health and safety were obtained from team members, their customers and the person responsible for health and safety. This method of obtaining case study data is shown at figure eight.

Figure 8.
Case Study Methodology



Two different types of team-based approaches were used as case studies. The first, a self-directed work team, the second a risk improvement team. This approach was adopted on the basis that not all organisations will have the resources, or need, to adopt the self-directed work team approach. Other team-based approaches may be just as effective for improving health and safety.

Two organisations were selected. The first, a large public hospital in regional Victoria operating risk improvement teams (RIT's). The second, a multi-national chemical manufacturer located in the western suburbs of Melbourne, Victoria, operating self-directed work teams (SDWT's) with a responsibility for health and safety.

Teams were selected on the basis of the researcher's knowledge and prior involvement with both organisations. The researcher had worked at the hospital and was responsible for the establishment of the RIT's. The researcher was also familiar with the SDWT's at the chemical manufacturer.

Initially, telephone contact was made with the Human Resource Manager at both organisations. This initial contact was followed up by a letter requesting permission to undertake the research. Both organisations granted permission and nominated a member of their health and safety staff to be the liaison person for the project.

This initial contact was followed by a preliminary site visit. The purpose of the visit was to brief relevant staff on the organisations role in the project and to discuss team selection and tentative meeting times.

The method of data collection for each organisation consisted of:

- focus group meetings with two workplace teams
- a focus group meeting with the teams' customers
- un-structured individual interviews with team members
- semi-structured individual interviews with the health and safety advisor

These methods of data collection are discussed more fully in the following sections.

4.3 Focus Groups

Rationale

The aim of this research project is ... *to study team members' and their customers perceptions of the "effectiveness" of team-based approaches to improving health and safety* ... Kreuger (1988, p.18) defines a focus group as *carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment*. On this basis, the definition of a focus group complements the aim of this project.

Ritchie and Herscovitch (1995) claim that it is difficult to secure worker involvement in research studies. The authors state that it is necessary *to formulate a process that will encourage participants to respond fully and honestly if useful findings are to ensue* (Ritchie and Herscovitch, 1995, p.472). To secure worker participation, Ritchie and Herscovitch, when studying life and coronary risk behaviours of blue collar workers, used focus groups. They argue that focus groups ... *strengthen the continuum of qualitative research in that they provide another tool of exploration* ... (Ritchie and Herscovitch, 1995, p.473).

Focus groups have also been used to gain research data from workers in the area of occupational health and safety. Caple et al (1997) used focus groups to study the integration of occupational health and safety into natural work groups in the Australian automotive industry.

Edkins and Pollock (1996) used focus groups as stage one of their research methodology when they studied pro-active safety management within an Australian rail context.

In summary, the rationale for the use of focus groups in this study is three-fold:

1. Focus groups are a recognised tool for obtaining the perceptions of workers on specific issues.

2. Focus groups are a recognised tool for obtaining exploratory data.
3. Focus groups have been used as a method for obtaining data from workers in relation to occupational health and safety.

Segmentation

Focus groups were segmented into team “member” and “customer” categories. According to Morgan (1996), segmentation has two advantages. Firstly it builds a *comparative dimension into the entire research project* (Morgan, 1996, p.12). Secondly, *segmentation facilitates discussions by making the participants more similar to each other* (Morgan, 1996, p.12).

The decision to segment according to the categories of team members and customers was influenced by Syer and Connolly (1996) who argue that teams receive feedback from their customers and can only gauge their customers’ requirements by interacting with them. Hackman (1987) also argued that one measure of the effectiveness of teams is whether or not the team’s output is acceptable to those who receive it or review it.

Designing the Focus Group Questions

Stewart & Shamdasani (1990, p.62) advise that the number of questions asked of a focus group should not exceed 12. Krueger (1994) argues that there are five categories of questions:

1. Opening questions
2. Introductory questions
3. Transition questions
4. Key questions
5. Ending questions

These principles were taken into account when designing the focus group questions for this study.

Questions were designed to explore the variables associated with effective team work within the categories of variables identified during the literature review:

1. Organisational Context
2. Team Design
3. Team Process
4. Team Effectiveness
5. Team Player Styles
6. Temporal Factors

Twelve questions were developed. Questions progressed from the general to the specific. The questions were designed to uncover information on organisational variables, team process variables and variables related to effectiveness.

Questions were written to reflect the differences between the teams. That is, different questions were written for the risk improvement teams compared to the self-directed work teams. Likewise, different questions were developed for the customers of the risk improvement teams compared to the customers of the self-directed work teams. The focus group questions for each of these categories may be read at Appendix A.

Once written, the focus group questions were pre-tested. Stewart and Shamdasani (1990, p.66) argue that:

Pretesting of the interview guide provides an opportunity to determine whether the wording of questions is appropriate, to determine whether the questions elicit discussion, and to identify questions that are not understood easily.

The strategy Morgan (1995, p.520) adopts for pre-testing focus group questions is the individual interview as individuals are easier and cheaper to schedule.

Following the strategy used by Morgan (1995), focus group questions were tested in an individual interview with a person who has experience as a member of a University library team, and in particular, a library health and safety improvement team. The interview took place in the University of Ballarat library. The interviewee found the questions clear, appropriate and delivered the required information.

Selecting Focus Groups

Two risk improvement teams and two self-directed work teams were selected to participate in the project. This required a process of negotiation with the liaison person from each organisation. Eventually teams were selected on the recommendation of the liaison person based upon local knowledge of the various teams.

In the case of the risk improvement teams, the two teams selected had been together for similar periods of time, but one was thought to be out-performing the other. The two other teams were discounted on the basis of just being formed, or about to undergo significant restructure in accord with organisational changes. The researcher provided the organisation with a *Statement for Potential Participants* (see Appendix B) and the liaison person accepted responsibility for communicating with the teams to gain their approval.

A similar process operated for the self-directed work teams. In this case however, the liaison person selected two high-performing teams; but also on the basis that the teams had been through distinct phases of team development prior to being identified as high-performing. These teams were also selected on the willingness and availability of team members to participate in the study.

The customer group was subject to a different selection process. Unlike the teams, the customer group were not a team - but rather individuals who would be brought together to share their perception's on the effectiveness of the team-based approach to improving health and safety.

To aid the selection process the customer was defined. Pike and Barnes (1994, p.258) define the customer as:

Anyone who receives the results (output) of your work. Customers can be external or internal (colleagues).

This definition was extended by the researcher for the purpose of this study as follows:

People within the organisation who are aware of, interested in and affected by the results of your work.

On the basis of this definition, the following selection criteria for customers was applied:

- People within the organisation who the team have identified as their customer in accord with the following definition of customer:

People within the organisation who are aware of, interested in and affected by the results of your work.

- People who the health and safety person believed, as a representative of the organisation, would have a view worth sharing, would be willing to participate and who would be available to attend.

Using this criteria, the liaison persons accepted responsibility for selecting customers. The liaison person requested teams to define their customer in relation to health and safety. Once a list of customers had been compiled, the liaison person contacted individuals to ascertain their willingness to participate. Again, each customer was given a *Statement for Potential Participants* (Appendix B).

For the risk improvement teams, a range of staff were selected from various occupations and departments.

For the self-directed work group, it was agreed that the Health and Safety Best Practice Board, which included union representatives, health and safety representatives and managers, was representative of the teams' customers.

Conducting the Focus Groups

Focus groups for both organisations were conducted on-site. The liaison person for each organisation arranged focus group meetings including venues, dates and times; in consultation with the teams. Although the on-site location of team focus group meetings varied, in all cases they were held in the teams' normal meeting rooms. To minimise disruption to the running of the business, meetings were held during the teams' normal meeting times as much as possible.

Customer focus group meeting meetings took place in on-site in meeting rooms.

One hour was allowed for each focus group meeting. The researcher and a research assistant were present at each meeting. At the start of each meeting, the researcher outlined the nature of the project and handed out an ethics consent form and statement for potential participants to each participant. The researcher stated that the meeting would be tape recorded to aid data analysis. It was stated that all data would be kept confidential. The researcher invited participants to arrange individual interviews with the researcher to discuss sensitive matters that individuals did not wish to share with the group. Participants were reminded that their participation was voluntary and that they could leave at any time.

Analysing Focus Group Data

Stewart and Shamdasani (1990) claim that there is no one best or correct method for analysing focus group data. The authors claims that for exploratory type research, *a simple descriptive narrative is quite appropriate* (Stewart and Shamdasani, 1990, p.102). This is achieved through transcribing meetings and discussing the conclusions that can be drawn (Stewart and Shamdasani, 1990, p.102). This qualitative or ethnographic approach *relies more on direct quotation of the group discussions* (Morgan, 1988, p.64).

Given the exploratory nature of this research project, focus group data has been analysed using an ethnographic approach. This approach is based upon a descriptive narrative drawn from transcripts of tape recordings of the meetings (Morgan, 1998).

Each category of perception (team members, customers, health and safety person) was analysed independently.

Transcripts were read in detail and key words, phrases and ideas relating to effectiveness were highlighted. Notes were made in the margins to record the type of variable to which the comments related and to which of the six categories associated with effective team work identified during the literature review that, in the opinion of the researcher, the variable belonged (organisational context, team design, team process, team effectiveness, team player styles and temporal factors).

4.4 Semi-structured and Un-structured Individual Interviews

Semi-structured individual interviews were conducted with the person responsible for health and safety within both organisations. Un-structured individual interviews were made available to focus group participants.

Semi-structured interviews took place on-site. A set of questions was developed as a guide (see Appendix A). These interviews were taped and transcribed for analysis.

5.0 Results

The results for each case study are presented separately. For each case study, results will be broken down into two categories. The first category, perceptions of effectiveness, presents how the teams, their customers and the health and safety advisor perceive the effectiveness of the teams. The second category, factors associated with effectiveness, presents what factors the teams, their customers and the health and safety advisor perceive are related to team effectiveness.

For each case study, a range of descriptive data including team size, length of time together, the number of team members participating in focus groups and researcher reflections are presented.

5.1 Chemical Industry Case Study

This organisation is a chemical manufacturer and located in the western suburbs of Melbourne. The company competes globally for market share. The company moved to a team-based approach to production as part of organisational change in the early 1990's. This change also resulted in a reduction in the numbers of staff on-site from 900 to 450.

Organisational change of this magnitude was precipitated by a very competitive environment and a need to do things better to stay in business.

The move to a team-based environment also coincided with new owners and a new management structure - including and a new human resource manager. The human resource manager believed a team based environment represented best practice.

The company has 30 teams on site, of which 13 are self-directed work (operating) teams with the remainder being support service teams.

Descriptive information relating to the teams that participated in this study is provided in table 8.

Table 8.

Chemical Industry Case Study - Descriptive Information

	Chemical Industry Team 1	Chemical Industry Team 2	Customer Focus Group
Responsible for	A production plant and all aspects of producing resins including health and safety.	Maintaining equipment associated with providing electricity, steam etc. to other production plants on site.	N/A
Specified OHS Goals	<ul style="list-style-type: none">Continually improving safety to exceed company standardsZero injuries, zero medical cases, zero incidents	Unclear what the specified OHS goals are for the team..	N/A
OHS activities undertaken by the team	<ul style="list-style-type: none">Hazard identification, risk assessment and control leading to identification of the top four critical issues to be tackled and the identification of the ten most dangerous chemicalsTrainingEmergency drillsWeekly safety audits eg. fire extinguishers, safety showers	<ul style="list-style-type: none">Hazard identification, risk assessment and control eg. noise - systematic and ad-hoc (hazard log)Auditing permit to work systemsInvestigationsHAZOPSEmergency proceduresSafety audits eg. housekeeping	N/A
Team size	12	19	N/A
Length of time together	1 year	3-4 years	N/A
Number present at focus group	9 (75%)	4 (21%) <i>Note: Numbers participating varied from one to four at different times during the meeting as participants kept up with the normal demands of their work.</i>	8
Number of requests for an individual interview	0	0	0
Occupations of those present at focus group	1 x team leader 1 x production technician 3 x technical operators 1 x production coordinator 3 x 'unknown'	All technicians	- Operator (chemical plant) - Health & safety rep (chemical plant) - Operations manager - Rotating shift engineer - Occ. Health Nurse - Operations Director - Health & safety rep. (Utilities area) - HSE compliance manager
Date, time and location of focus group meeting	Wed 18/6/97, 11.00am, on-site in the team office/meeting room as part of a regular team meeting.	Fri 20/6/97, 8.00am on-site in the team meeting room as part of a regular team meeting.	Thrs. 26/6/97, 8.00am, on-site in the HSE meeting room.
Length of focus group meetings	Approximately one hour. <i>Note: Due to production pressures, the team initially stipulated that they could only allow 30 minutes for the meeting.</i>	Approximately one hour. <i>Note: At one stage the meeting was stopped as participants attended to other duties.</i>	Approximately one hour.
Researcher reflections	Friendly, leader dominated, some members quiet, under time pressure, high sense of group, positive mood of group, moderate interaction with each other and the researcher	Disorganised, friendly, high sense of group, positive mood of group, eagerly interacted with each other and the researcher	Disorganised, friendly, union representatives vocal (positive), mood of discussion positive, very eagerly interacted with each other and the researcher

5.1.1 Chemical industry team 1 focus group

Perceptions of Effectiveness

The Chemical Industry Team 1 believed that overall, they at been successful at improving health and safety.

Team members felt that the team approach to improving health and safety had achieved more than any individual could have achieved on their own. This feeling was reflected in the following comment:

I think more heads work better than just one. You can get more ideas out of more people than you could think up yourself. I think people work better as a team than they do by themselves.

Team members also enjoyed working together and stated that they would work together in other teams. These feelings were summed up by the following remark:

It's particularly good that in this particular team we are all on the same wavelength.

Factors Related to Effectiveness

The Chemical Industry Team 1 perceived that they had been effective at improving health and safety and identified a number of team and organisational factors that either contributed to or detracted from their effectiveness.

Team members spoke of the organisations commitment to health and safety. This included the organisation establishing goals for health and safety and developing guidelines to help teams achieve the organisations health and safety goals. To achieve the organisations goals, the teams had developed their own health and safety goals and improvement plans. This situation was reflected in the following comment:

This company has a ... improvement process and it's spilt into several areas and one of them is safety ... The company has given us some guidelines and then we have looked at our plant and looked at the particular issues relevant to our plant and then we come up with quite a lot of guidelines or goals that we want to achieve as a team in this year.

The team stated that their goals were *zero injuries, zero medical cases and zero incidents*. The team stated that to achieve their goals, they had identified their top four health and safety issues.

The team had developed a mission statement which includes a reference to health and safety stating that the team aspired to continuous improvement in excess of company standards for safety.

The team said that they had established a health and safety sub-team to tackle health and safety problems. This sub-team also included the elected health and safety representative.

The team said that they allocated time on a weekly basis to achieve their health and safety goals. This is reflected in the following comment:

You've got to make time of a Wednesday. We use the alarm as a prompt to - we must do the safety shower checks, we must check all the fire extinguishers and we do a safety audit on a different safety issue each week and we use that as a prompt to just stop production and get it done. So it's done every week.

Although the team plans time for health and safety activities, they also felt that production pressures, at times, override all other team activities:

Well according to the company, safety is our biggest priority, and that is fine to say that safety is number one, but when it comes down to it, a lot of the time safety is not so much pushed to the side, but we do make it second to production at times when we are busy.

However, the team reported that a number of health and safety improvements had been or were in the process of being implemented. This process was assisted by the team having control over a budget through which they could initiate improvements:

We have got the authority to spend a certain amount of money on safety problems ... for example, we have got a problem with a pretty dangerous chemical and we're looking at ways of handling it, we have purchased a special plunger at about \$400 and tried that out, I think it will be reasonably successful with this plunger that we are using, it's an older one, we might have to buy another one which is about \$600 or \$700, but we can buy those sort of things within our budget, and I think it works pretty well, we can discuss it amongst a few of us, maybe bring it up at a team meeting and then go and do something about it.

For major cost improvements, the team stated that they required the company's approval. This process usually took between three and six months. For example:

We have got approval, and it's nearly finished, for a vacuum lifting system to help lifting of the drums ... The project we are working on at the moment is building a new steel frame for packing out of our gel coat from tanks. It's a big steel frame and will probably cost about \$10,000 to build and what we have done has been discussing the ways in which we can do it so there have been some drawings that have gone back and forth ... we have to push through this project because what the guys are doing is not really a safe practice and it is something that is seen as a priority for the team to push through as quickly as we can ...

In commenting on team factors associated with team effectiveness, the team felt that even though the team had the frameworks in place to manage health and safety, it still required the involvement of everyone, that it takes a lot of energy and that *if we don't put the effort in then it won't happen*. The team felt that a lot of this energy came from the team leader.

5.1.2 Chemical industry team 2 focus group

Perceptions of Effectiveness

The Chemical Industry Team 2 believed that overall, they had been successful at improving health and safety. The following comments from participants support this belief:

- *I think it is probably 100% improvement ...*
- *I think there is definitely an improvement in the participation or appreciation by all the guys, more than under the old system.*
- *I think we had a problem before but I do not think we have a problem now ...*
- *You can actually fix things.*
- *... because of the team development, the effectiveness has greatly improved.*

Team members agreed that the team approach to improving health and safety had achieved more than any individual could have achieved on their own.

Participants also agreed that they were enjoying working as a team, that the team approach allowed more people to be involved:

I'm more involved ... there is probably as much dissension goes on, but the blokes are more willing to come out and say well look, this is what should be happening ... whereas before the mentality was come in and go home and that was it ... they wouldn't participate ...

Factors Related to Effectiveness

The Chemical Industry Team 2 perceived that they had been effective at improving health and safety and identified a number of team and organisational factors that contributed to their effectiveness.

At the team level, the participants described how the Chemical Industry Team 2 was broken down into six different sub-teams, one of which is health and safety. The health and safety sub-team meets monthly and reports back to the team Board.

Participants also felt that they had always worked as a team so that the change to a team-based environment was less trouble-some. The team also spent considerable time thinking about and planning for the move to a team-based environment.

According to one participant *we actually spent about six to nine months discussing the team concept and looking at everything we did ...*

The participants described themselves as a self-managing team with a responsibility for *maintenance, operation and costs, whereas before there were people who said do this, do that, and there wasn't ... the interest from the operators.*

In reflecting upon the team's purpose and goals in relation to health and safety, the participants offered the following thoughts:

- *We monitor how we are going with say WorkCover ...*
- *We do audits on our work permits ...*
- *... attempting to run the place as safely as possible.*
- *Basically we don't want anybody to go home injured, we want them to come to work well.*
- *No lost time injuries and no time off.*

The participants were aware of the organisations commitment to safety, but referred to old organisational goals in this respect. Although the participants were vague about

organisational and team goals for health and safety, they were able to cite a number of safety improvements that the team had achieved:

... putting in a number of sound proof enclosures on various noisy equipment that had been identified by a noise survey

Team members also participated in a process of identifying hazards and assessing and controlling risks associated with those hazards, this also included a log book for reporting hazards. The participants felt that as a team, they had the capacity to solve their own problems:

If we put something in the book and you believe it has to be done you can actually, the person who puts it in the book can drive it right through ...so you do have ownership of safety, of the whole safety thing ... you do have a lot more control of your own destiny ...

Participants felt that the fact that communication processes were within the team rather than a *disappearing hierarchy* was an important factor. However, although the team process is more consultative and involving, it will die off over time if you don't have a driver:

We need to make an individual in each team a bit more accountable for organising the meetings and driving the function of the team ... we found ... we basically needed a bit more leadership within each team ...

The Chemical Industry Team 2 has tackled this problem by each of the sub-teams organising its own leader, a position that is rotated for team development purposes.

5.1.3 Customer focus group

Perceptions of Effectiveness

Participants felt that in relation to moving from the old organisational structure based on hierarchy to the new based on teams that:

There was a lot of difficulty in the transition, there was lots of confusion as to what the roles were and hence the fact, performance fell.

The teams' customers perceived that some teams on site had been *very successful and some are still striving to get there*. The teams' customers believed that there had been measurable reductions in the number and severity of accidents. One customer felt that the team-based approach *definitely* contributed to this performance.

The customers felt that the team-based approach to improving health and safety had achieved more than individuals (*I don't think we could have achieved this much at an individual level ...*) could have achieved on their own, or at least with less pain, as attested to by the following remark:

... previously if we wanted one of the safety issues fixed up we'd black ban it if it went that far ...

There was general agreement that the team-based approach has brought about organisational change in the area of labour-management relations. In the new (team-based) industrial climate black bans don't happen any more:

Speaking from the industrial side of it we are doing now what the company wanted us to do for years, it's just before we wouldn't concede. Now we've recognised it should be done for all of our benefits whereas before it was them and us, now it's all of us. So the climate has changed and we're all in the same boat.

Factors Related to Effectiveness

Customers perceived that to varying degrees, teams has been effective at improving health and safety and identified a number of team and organisational factors that contributed to their effectiveness.

The participants felt that the advent of an Occupational Health and Safety Best Practice Board (OHSBPB) across the plant had provided strategic focus for the teams. This focus included the *setting of goals and objectives and the communication of those goals and objectives into the workplace*. The OHSBPB arose when the health and safety committee *lost its way a bit .. there was pretty limited attendance ... didn't really have anything that set overall direction and monitored how we were going or tried to provide input to the teams on safety*.

The participants also felt that the introduction of teams resulted in a drop in performance. This was due to a:

... lot of the focus was on not being directive or not telling people what to do ... rather than getting the teams to develop in terms of what they ought to be doing and that really left a gap where there wasn't strong positive focus on particular issues.

To add to this lack of initial direction, the participants thought that the lack of role clarity early on also detracted from the effectiveness of the teams. This was summed up by one participant as follows:

... when we went into teams the issues of who was responsible for all aspects of production, including safety, including environmental, and so forthwith was pretty vague and reasonably ill-defined and we were trying to get teams to take all the issues on board but it did not necessarily flow in every team.

Participants identified that it was not until the organisation adopted goals for health and safety twelve months after the teams were implemented that *gave a focus for all the teams on safety*.

Moreover, participants identified the cultural change that had taken place as reflected by the following comment by a participant;

We are really looking at cultural change where people take the old system where you had your safety department they came up with a plan and everything filtered down. This way, we've turned it upside down on its head, we get a response from the teams, and we're trying to direct the resources to satisfy them.

The participants also identified training in hazard identification, risk assessment and risk control as an important factor.

Devolution of financial responsibility (within limits) was also identified as an important factor associated with team effectiveness.

5.1.4 Health and safety person interview

Perceptions of Effectiveness

The health and safety person believed that generally the teams had been successful, stating that *it depends on the team, but I would generally say there wouldn't be a person on site that would go back to normal*.

Factors Related to Effectiveness

The health and safety person was able to identify a number of organisational factors that both supported and detracted from team effectiveness.

This person thought that the fact that health and safety was added to the teams agenda three years after the teams were introduced was a mistake. This left the teams without boundaries and guidelines. This situation only turned around after the introduction of corporate goals for health and safety and the Best Practice Board.

The health and safety person also felt that the role of the health and safety representative was and will be central to the success of the teams. The organisation is training health and safety representatives to become change agents, leaders and communicators *to drive it (health and safety) in their teams*.

A corporate health and safety audit from the parent company in the USA was also cited as a factor that had lead to increased on-site commitment at the managerial level which had been translated into support for the teams.

5.1.5 Summary of results

Table 9 summarises the results of this case study.

Table 9.
Chemical Industry Case Study - Summary of Results

	Perceptions of effectiveness	Factors supporting or detracting from effective team-work
Chemical Industry Team 1	<ul style="list-style-type: none">• Effective• Would work in other teams• Better than individuals acting alone	<p>Factors supporting effective team work:</p> <ul style="list-style-type: none">• Leadership within the team• Team goals• Organisational goals and guidelines for health and safety• Team planning for safety• Team organising time away from core production activities for safety• Team empowered to spend money to solve own problems• A health and safety sub-team• Able to attract major capital works expenditure for safety related improvements• Improved communication between teams and team members• Health and safety representative a part of team• Management commitment• Time together <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Budget cuts at plant design stage• Production pressures• Slow response time to major capital items• Level of team effort - team running out of energy• Time together in a new plant• Lack of time off for training
Chemical Industry Team 2	<ul style="list-style-type: none">• Effective• Would work in other teams• Better than individuals acting alone	<p>Factors supporting effective team work:</p> <ul style="list-style-type: none">• Health and safety sub-team• Authority to implement solutions to problems• Time spent planning the transition to teams• Goals• Organisational goals• Availability of financial resources to fix safety problems• Flattened hierarchy leading to better communication within teams• Getting people involved <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• People running out of energy to drive the process• Lack of leadership• Over ambitious goals
Customers	<ul style="list-style-type: none">• Effective.	<p>Factors supporting effective team work:</p> <ul style="list-style-type: none">• Organisational goals• Boundaries• Best Practice Board• Management commitment <p>Factors detracting from effective team work:</p>
Health and Safety Person	<ul style="list-style-type: none">• Varies from team to team but generally effective	<p>Factors supporting effective team work:</p> <ul style="list-style-type: none">• Parent company pressure.• Corporate objectives.• Boundaries.• Training.• The role of the health and safety representative <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Health and safety not being on the teams agenda when teams were first introduced• No organisational goals for health and safety• No boundaries on the teams

5.2 Health Industry Case Study

This organisation provides acute, geriatric and psychiatric health care services from two sites located in regional Victoria. This study focused on the acute care (hospital) site.

The hospital adopted a team-based approach to improving health and safety in 1994. Up until that time, the hospital operated a central health and safety committee. However, the health and safety committee had reached a point where enthusiasm and numbers attending meetings had waned. Further, it was felt that the health and safety committee was unable to affect improvements at the workplace level, in part due to the absence of departmental managers on the committee.

To involve managers and their staff more actively in the process, and to bring about health and safety improvements at a local level, the hospital progressively implemented four risk improvement teams. These teams cover the broad areas of hotel services, engineering staff, medical staff and nursing staff. With the introduction of more localised teams, the central health and safety committee was abolished.

The risk improvement teams comprise a mix of management and employee representatives. Employee representatives may be elected health and safety representatives, or volunteers who are interested in improving health and safety.

Descriptive information relating to the teams that participated in this study is provided in table 10.

Table 10.
Health Industry Case Study - Descriptive Information

	Health Industry Team 1	Health Industry Team 2	Customer Focus Group
Area of responsibility and composition	All nursing areas across the hospital. 13 employee representatives (some who are also health and safety representatives) and 2 management representatives.	Cleaning, catering, linen supply and stores areas of the hospital. 5 employee representatives (some who are also health and safety representatives) and 3 management representatives.	N/A
Specified OHS Goals	No goals set.	None specified.	N/A
OHS activities undertaken by the team	<ul style="list-style-type: none">• Evacuation exercises• Monthly meetings where problems are raised	<ul style="list-style-type: none">• Monthly meetings where problems are raised and resolved	N/A
Team size	15	8	N/A
Length of time together	3.5 years	3 years	N/A
Number present at focus group	5 (33%)	4 (50%)	5
Number of requests for an individual interview	0	0	0
Occupations of those present at focus group	<ul style="list-style-type: none">- Senior Nurse Manager- Registered Nurse (surgical ward)- Clinical Nurse Specialist (acute medical ward)- Registered Nurse (intensive and coronary care unit)- Nurse educator <i>Note: The senior nurse manager was called away to attend to an industrial dispute shortly after the start of the meeting.</i>	Representatives from: <ul style="list-style-type: none">- Linen supply- The cafeteria- Stores- Health and Safety Representative (also a cleaner)	<ul style="list-style-type: none">- Registered Nurse (surgical ward)- Cleaner- Storeperson- Ward Clerk- Registered Nurse (rehabilitation)
Date, time and location of focus group meeting	Fri 13/6/97, 12.00 midday, on-site in a function room. <i>Note: This was the second attempt to conduct this focus group. It was originally planned to conduct the focus group as part of the monthly team meeting, but this did not occur.</i>	Fri 13/6/97, 1.45 pm, on-site in engineering plans room (normal meeting room for the team) <i>Note: This was the third attempt to conduct this focus group. It was originally planned to conduct the focus group as part of the monthly team meeting, but this did not occur.</i>	Thrs. 5/6/97, 1.00 pm, on-site in a function room.
Length of focus group meetings	Approximately one hour.	Approximately half an hour.	Approximately one hour.
Researcher reflections	Friendly towards each other, shared a common (although negative) view which seemed to bond the group, under time pressure, positive sense of group, mood of the discussion was low, eagerly interacted with each other and the researcher	Aggressive toward the researcher, under time pressure, curt responses, restrained, blocking body language, cautious and concerned over the focus group process, average sense of group, mood of the group tense, moderate eagerness to talk	Polite disagreement, generally amicable, mood of discussion down, good interaction.

5.2.1 Health industry team 1 focus group

Perceptions of Effectiveness

The Health Industry Team 1 perceived that they had not been successful at improving health and safety, this view is summed up by the following remark:

I don't think we have been successful at all because of the items on our agenda that come up month after month after month, and if you look at some items that have been there for nearly two years, if not more, that's terrible. So therefore, as a committee, we are not successful because we have lost power because it goes out of our hands and goes up to a higher level and doesn't go any further.

Team members felt that they had not achieved more working as a team than they could have achieved working alone. The perception was that either way, it did not matter, as there was no *driving force* for health and safety. Even so, participants agreed that the team concept was good and has the potential to work.

Even though they did not view themselves as effective, participants said that they enjoyed working together. Participants spoke of the team as a health and safety *support group*, a *frustration group* and a *sounding board for each other*. Participants agreed that they would work together in other teams.

Factors Related to Effectiveness

Participants were able to identify a number of team and organisational factors that detracted from their effectiveness.

At the team level, participants did not share a common view on how their performance was measured or the purpose of the team. Some participants thought performance was measured by *achievements of things that have been brought to us that have been addressed*, whilst another participant thought that performance may be measured in sick or accident days. Views on purpose were equally wide ranging, the following are some examples:

- *I think we are there as a mechanism for prevention ...*
- *... to look at ways of preventing injury ...*
- *... to minimise the risk ...*

Further, the team had no goals, although they met monthly.

Participants also felt that they lacked sufficient training in health and safety and that it is difficult to be effective in an area that you *don't know anything about*. Participants attributed the lack of training to a lack of leadership, in particular, the fact that the organisation did not have a full-time health and safety advisor driving the process - a *driving force*.

At the organisational level, participants felt that time pressures were a constraint that prohibited people from attending meetings, the following comment is an example:

I think time is probably important ... people who should come to the meetings don't come because they haven't got the time to come because they can't be released from the ward area.

However, one participant observed that time is a constraint for some meetings and not others, for example:

... I go to other meetings too and there is a larger attendance at other meetings than what there is at OHS ...

One participant commented that the difference in attendance at meetings could be attributed to the low priority given to health and safety by the organisation.

Participants also felt that the organisation took too long to resolve health and safety problems that the team identified. And that in turn, this delay was related to the low priority given to health and safety, resulting in little or no money being available to solve health and safety problems. To amplify this point, participants cited ventilation

problems in patient showers and the decanting of a caustic dishwashing agent as examples of problems that had taken at least two years to resolve (and not to the satisfaction of the team).

Participants felt that the inability to resolve health and safety problems was exacerbated by the fact that the Nurse Manager on the team had insufficient power to get things done. The following quote sums up this sentiment:

They didn't give them any power at all. So they are there on the committee but they are just the same as us, they haven't got any decision making power at all.

The team felt that the problem was the need to feed problems up the organisational hierarchy for resolution, resulting in delays in both resolution time and feedback to the team, this is reflected in the following response:

A lot of feedback is very slow though, it doesn't come back within a month of the next meeting ... it might be six months before you'll actually get a response.

Participants said that when they did receive feedback it was often in the negative, and used an example to illustrate this point:

Like the hand rails on the other side of the fire exists. I think we got feedback on that and it said it couldn't be done, it costs too much ...

5.2.2 Health industry team 2 focus group

Perceptions of Effectiveness

The Health Industry Team 2 perceived that they had been successful at improving health and safety, to quote the participants:

- *We are pretty good because when we have our meetings we note all the problems that have been solved and the things that have been fixed.*
- *I think before it used to drag on ... but now we seem to be solving the problems straight on.*

Participants supported their belief that they had been successful by citing a number of improvements that they had made as follows:

- Purchased trolleys
- Drains in the waiting bay to remove excess water
- Wet spots in the cafeteria have had strips put down
- Fixed snap on hoses to taps in the cleaners rooms on the wards to prevent cleaners lifting the bucket of water

Team members felt that the team approach to improving health and safety had achieved more than any individual could have achieved on their own. In comparing the two approaches, one participant made the following remark:

... if it was just an individual thing people might just mouth off between each other and anyone can make promises and forget about it the next day.

Team members also enjoyed working together as a team.

Factors Related to Effectiveness

The team were able to identify factors related to its success, as well those that at times detracted from the team being successful.

Participants attributed their success to better management as follows:

I think it's because we have got better managers now. The managers ... make themselves more accountable and they are judged on the results they get and they make sure they get results ...

The team had not received training in teamwork or health and safety, however, participants did not feel this detracted from their effectiveness. Participants did feel they would benefit from having a full-time health and safety advisor to provide them with up to date information and advice.

5.2.3 Customer focus group

Perceptions of Effectiveness

The teams' customers perceived that the teams were effective at fixing small problems, but not bigger problems as reflected in the following comments:

- *I believe they are successful as far as small problems go ... I'm sure that they get fixed up quite promptly but the bigger issues, I'm sure that they just get put aside because of the cost factor.*
- *We have quite good success at the moment with small issues. Like light weight mops.*
- *I find that inexpensive things happen straight away. Any problems that you have got and it can be fixed it will be fixed as long as it doesn't cost very much.*
- *I think they are reasonably effective but there are inadequacies with funding ...*
- *... they are trying to get things done ...*

However, one participant felt that the team was *slow and not achieving*.

The participants also perceived that the team-based approach had achieved more than individuals could have achieved acting alone, as reflected by the following comment:

I think that because it is an official group and they take minutes of meetings, it can't be swept under the carpet, it's there on the table, it's in black and white and they seem to act on it a lot better than if it was with an individual person. So the group I think is useful.

Factors Related to Effectiveness

The participants identified a number of factors that supported and detracted from the effectiveness of the team.

Customers perceived that the teams communicated well with their customers providing adequate feedback on team activities. The forms of communication included newsletters, minutes of meetings (either posted to individuals, tabled at department meetings or pinned on noticeboards).

However, one participant felt that they had not received feedback, detracting from this participants perception of the effectiveness of the team. This participant preferred to take direct action on health and safety problems. This participant referred to the caustic dishwashing agent as an example of taking direct action, telling the following story:

We have taken direct action ... I think most of the other wards have followed suit as far as the dishwashing detergent goes. We had one that was very caustic and a girl did burn her arm and I think the saga is still going on two years down the track. But I got sick of the saga and I got drums and now I dispense it through a tap into a container that's safer. And I am keep being told that the problem is in hand and it is two years down the track.

Participants agreed that a lack of financial resources for improving health and safety was a significant factor detracting from the effectiveness of the teams , as reflected by the following comment:

It's a necessary evil to them I think, they don't want it because it costs money ...

Another participant felt that the size of the department was also related to effectiveness with the small departments being overlooked. This participant also identified that problems have *to go through too many people to get a result*.

At the organisational level, participants felt that recent organisational changes had become the priority for senior management, resulting in health and safety being a low priority, as summed up by the following remark:

... you've got restructuring problems that have occurred over this year ... that's taken up a lot of their priorities in management especially, so OHS, I think they just want to come back to that later.

5.2.4 Health and safety person interview

Perceptions of Effectiveness

The health and safety advisor perceived that the team-based approach is more effective than what the hospital previously had (a health and safety committee).

Factors Related to Effectiveness

The health and safety person identified a number of factors related to the effectiveness of the teams.

Firstly, the health and safety advisor believed that *it's difficult to get the teams to focus on hospital wide goals*. Teams tend to concentrate on local issues and do not see themselves contributing to the achievement of hospital objectives for health and safety.

The fact that the organisation is going through a period of organisational change resulting in downsizing and cost cutting had impacted on the teams in a number of ways. Downsizing meant that teams experienced staff changes which tended to destabilise the teams. Cost cutting had also resulted in a shift away from a focus on prevention, leading to a reactive rather than pro-active approach to health and safety.

The factor that most supported the effectiveness of the teams was the composition of the teams themselves. Membership consists of managers (who could implement decisions), health and safety representatives and staff interested in improving health and safety. Through this mix of membership, health and safety had become an integral part of the management process.

5.2.5 Summary of results

Table 11 summarises the results of this case study.

Table 11.
Health Industry Case Study - Summary of Results

	Perceptions of effectiveness	Factors supporting or detracting from effective team-work
Health Industry Team 1	<ul style="list-style-type: none">• Not effective• Would work in other teams• Not necessarily better than individuals acting alone	<p>Factors supporting effective teamwork:</p> <ul style="list-style-type: none">• Although ineffective, the fact that the team shared a common frustration enabled them to survive in the face of failure <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Lack of senior management commitment• Lack of funds for health and safety• Lack of decision making power at the team level• No training• No leadership, in particular, no full-time health and safety advisor• No accountability upon senior managers• Health and safety a low priority for the organisation
Health Industry Team 2	<ul style="list-style-type: none">• Effective	<p>Factors supporting effective teamwork:</p> <ul style="list-style-type: none">• Management commitment and accountability• Enthused team members• Getting results <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Lack of a full-time health and safety advisor
Customers	<ul style="list-style-type: none">• Effective at fixing small problems only	<p>Factors supporting effective teamwork:</p> <ul style="list-style-type: none">• Feedback from the teams <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Lack of funds for health and safety
Health and Safety Person	<ul style="list-style-type: none">• More effective than the previous health and safety committee	<p>Factors supporting effective teamwork:</p> <ul style="list-style-type: none">• Team composition <p>Factors detracting from effective team work:</p> <ul style="list-style-type: none">• Organisational change• Reactive rather than pro-active culture towards health and safety• Lack of funds• Changes in senior managers• Changes in team membership

6.0 Discussion

This section will discuss the results of the research before proposing a model for implementing effective team-based approaches to improving health and safety.

This discussion is broken down into two areas; the strengths and weaknesses of using focus groups in organisational settings, and an analysis of results of both the chemical and health industry case studies.

6.1 Focus Groups

The use of focus groups, although widespread within the social sciences, is still relatively new with most use of focus groups occurring within the past ten years (Morgan, 1996). Focus group research is gaining credibility within academia and in the process, some of the myths about focus groups are breaking down (Krueger, 1995). According to Kreuger (1995) it is a myth to suggest that focus groups in the work place should be avoided. Krueger (1995) argues that the work environment is an area of increased use for focus groups. If this argument is to hold true, then the experience of conducting focus groups within organisations for this study revealed shortcomings that need to be identified and resolved.

The shortcomings associated with conducting focus groups in organisations identified during this study may be broken down into two areas; ethical issues, and communicating with the organisation for the purposes of recruiting participants and planning and organising focus group meetings during work time.

Ethical Issues

Ethical issues were first raised during the process of gaining approval from the University of Ballarat Human Research and Ethics Committee (HREC) for this research project. In particular, the HREC questioned how confidentiality would be maintained given that individuals in a workplace will be known to one another. This could lead to a situation where individuals could feel embarrassed and uncomfortable in discussing concerns.

According to Smith (1995), although the use of focus groups has become much more widespread *very little has been written about the ethical issues of this methodology* (Smith, 1995, p.479). Smith identifies four principles that guide ethical choices based on the four major principles of Beauchamp and Childres (1994, cited in Smith, 1995) as follows:

1. Autonomy - respect the decision making capacity of individuals
2. Nonmaleficence - avoiding harm, risk, or wrong to those being studied
3. Beneficence - maximising good outcomes for science, humanity and the individual research participants
4. Justice - fairly distributing benefits, risks and costs

Smith (1995) attempts to describe the ethical concerns unique to focus groups. The first of these is over-disclosure of personal information due to the synergistic effect of the group. Smith (1995) argues that the contrary may also be true and that participants may withhold information. Smith (1995) also identifies that the fact participants reveal themselves to researchers as well as each other and the intensity of participant interactions as concerns.

In attempting to address these ethical concerns, Smith (1995, p. 483) acknowledges that:

... focus group researchers cannot promise or ensure strict and absolute confidentiality. This is due mostly to the fact that the researcher does not have control over what participants may disclose after they leave the focus groups.

Smith (1995) recommends that researchers should inform participants that this may occur during the introductory statements made by the researcher. Further, Smith (1995, p. 483) recommends that researchers advise participants of what will be done with tapes and notes of the meetings, provide a debriefing for participants and continually monitor the stress levels of the group and be prepared to intervene.

For this study, ethical issues were in part dealt with by providing participants with a statement prior to their participation which stated that they were free to leave the meeting at any time or seek an individual interview with the researcher. It could also be argued that meetings similar to focus group meetings are a regular part of organisational life. That is, health and safety is an area of regular discussion between individuals in organisations, for example, health and safety committees, where participants may share differing views, and therefore focus groups considering health and safety matters pose no greater risk to the individual than exiting organisational life.

However, it would be unwise to dismiss these ethical concerns and further thought and discussion needs to be given to the ethical concerns of conducting focus groups in organisations in particular.

Communicating with the Organisation

This research project revealed difficulties in the process of recruiting participants and arranging focus group meetings.

Both participating organisations delegated their health and safety advisor as the liaison person for the project. The researcher initially meet with the liaison person to outline the project and to discuss the recruitment of participants and meeting times. It was decided that to minimise disruption to the running of the organisation, that focus groups would be held during normal meeting times. The liaison person accepted responsibility for communicating with the teams and participants on behalf of the researcher. The researcher provided the liaison person with the statement for potential participants.

At this point the researcher lost control over the recruitment process in both organisations. The liaison person arranged meetings and the researcher assumed that participants understood the purpose of the research project and their role as a participant. Unfortunately, this was not the case, particularly in the health industry case study.

In the health industry case study, participants were unaware of the purpose of the research and their role. At times this led to heated debate, resulting in some participants walking out of the meeting and meetings being cancelled. Scheduling other meetings around work priorities also proved difficult, with most staff being reluctant to make themselves available for one hour due to work pressures.

In the case of the Health Industry Team 2, two focus group meetings were cancelled and the focus group only took place on the third attempts after management directed staff to attend. The affect of this action on the results of that focus group is unknown, but participants were certainly “cold” towards the researcher and the meeting was completed within half an hour as participants were anxious to resume work.

This experience with conducting focus groups within organisations reveals that it was difficult to work as researcher from the outside. The process of working through a liaison person may be prohibitive as information and communication flows are then outside the control of the researcher. It would be preferable for the researcher to meet directly with the potential participants within the organisation.

If, as Krueger (1995) suggests, that the work environment is an area of increased use for focus groups, then issues such as those raised here need further thought and discussion among researchers.

Advantages and Disadvantages of Focus Groups

Notwithstanding the concerns raised so far, focus group research has other limitations as well as advantages that need to be acknowledged when discussing results.

According to Krueger (1994) focus groups do have limitations. These limitations include less control of the group by the researcher, participant interaction may influence the discussion, data is difficult to analyse, the moderator may bias responses, groups vary - with each group being unique, and that focus groups are difficult to assemble. The last point has already been discussed in relation to this study.

Stewart and Shandasani (1990) identify other limitations. These limitations include that that given the small number of participants - it is difficult to generalise to a larger population, one member may dominate the group and that more reserved participants may be reluctant to talk. In all focus groups conducted it was the case that some participants talked more than others. This situation was addressed by the researcher who attempted to draw responses from those reluctant to talk by asking each participant for their opinion.

However, the limitations of focus groups must be balanced against the advantages. Focus groups allow the researcher to interact with participants, to clarify responses, to ask follow-up questions and to probe responses (Stewart and Shandasani, 1990). This was certainly the case in this study. The researcher “bounced off” participant responses to probe issues to a greater depth and raise questions not previously considered by the researcher.

According to Stewart and Shandasani (1990), the researcher can also observe non-verbal signs such as smiles and frowns.

Importantly, focus groups provide *an opportunity to obtain large and rich amounts of data in the respondent's own words* and allow participants to *react and build upon the responses of other group members* (Stewart and Shandasani, 1990, p.16). Overall, the focus groups produced over eighty pages when transcribed.

6.2 Chemical Industry Case Study

Two of thirteen (15%) self-directed work (operating) teams on site participated in this case study, together with a group of the teams' customers (the Occupational Health and Safety Best Practice Board) and the health and safety advisor.

Overall there was agreement between the teams, their customers and the health and safety advisor that the team-based approach to improving health and safety was effective. The health and safety person qualified this by stating that effectiveness varied from team to team but that effectiveness had improved over time.

This case study confirmed the importance of organisational factors in relation to team effectiveness. In particular, the development of organisational goals and guidelines for health and safety. This finding is consistent with Sundstrom et al's (1990) Ecological Model that identifies the importance of mission clarity. These goals and guidelines provide the teams with direction and purpose in planning their own health and safety activities. This finding is also consistent with the view of Katzenbach and Smith (1993) who argue that teams require specific goals, and Parker (1990), who argues that teams require a clear purpose. These findings also support Hackman's (1987) Normative Model variables related to the organisational context and group design .

Allocating financial and decision making responsibility to the teams also enabled the teams to implement their own solutions to health and safety problems (within financial limits). This finding is consistent with Hackman's (1987) Normative Model. Hackman (1987) argues that teams require material resources, including financial resources, to be effective.

This case study also revealed that the level of team effort is an important factor in relation to the effectiveness of the teams. That is, teams felt that they ran out of energy. This finding is consistent with Hackman's (1987) process criteria of effectiveness - that the overall effectiveness of the team is dependant upon the level of collective group effort. In the Chemical Industry Team 1, for example, the Plant Technical Leader was providing this energy. The organisation is also using the health and safety representative in a leadership and change role within teams. However, according to Hackman, the rest of the team would need to share responsibility for providing this energy if the team is to be effective.

Competing priorities, particularly production related priorities, have the potential to detract from the effectiveness of the teams. This issue is not discussed in the literature and is potentially of great importance if team-based approaches to health and safety are to sustain their effectiveness over time.

Measures of team effectiveness identified during this case study include:

- A reduction in injury rates across the site
- A general increase in awareness of health and safety
- Cultural change from an “us and them” approach to solving health and safety problems to a “we” approach
- The number of solutions to health and safety problems that had been, or were in the process of, being implemented
- Achievement of team health and safety goals
- Team members enjoy working in teams
- The teams’ customers are satisfied with the output of the teams.

6.3 Health Industry Case Study

Two of four (50%) risk improvement teams on site participated in this case study, together with a group of the teams’ customers and the health and safety advisor.

The move to a decentralised team based structure is consistent with the recommendation by Charney (1988) who advocates hospitals operate a decentralised health and safety committee model, arguing that that a centralised model will only touch upon generic safety issues - not allowing department specific issues to be addressed.

Perceptions of the effectiveness of the teams at improving health and safety varied. The Health Industry Team 1 perceived that they had not been effective. The Health Industry Team 2 perceived that they had been effective. The teams’ customers perceived that they were fixing small problems only. The health and safety person perceived that the team-based approach was more effective than past approaches, for example the health and safety committee.

This study again confirmed the importance of the organisational factors in relation to team effectiveness - or in this case, lack of effectiveness. Although the organisation has objectives for health and safety, these were unknown to the teams. The teams had not developed their own goals and did not believe that they were contributing to organisational goals for health and safety.

Teams and their customers generally agreed that there was a lack of management commitment to health and safety. Lack of commitment resulted in lack of funding and a lack of accountability for senior managers.

The absence of a full-time health and safety advisor to provide leadership was also perceived as detracting from the effectiveness of the teams.

However, the Health Industry Team 2 was an exception. Where the Health Industry Team 1 had failed, the Health Industry Team 2 had flourished. This finding is consistent with previous anecdotal findings that suggest that teams may work in one part of an organisation, but not another (Lanier, 1992). The Health Industry Team 2 attributed their success to the commitment of their manager. The Health Industry Team 1 attributed their failure to the hierarchical and convoluted decision making processes of the organisation.

The finding that the teams focused on local issues confirms the findings of Caple et al (1997) who found that teams in the automotive industry also focused on local issues. This is in contrast to Charney (1988) who advocated a decentralised model so that local issues would be addressed. This finding points to the need for possibly a central steering group to support workplace teams.

Measures of team effectiveness identified during this case study included:

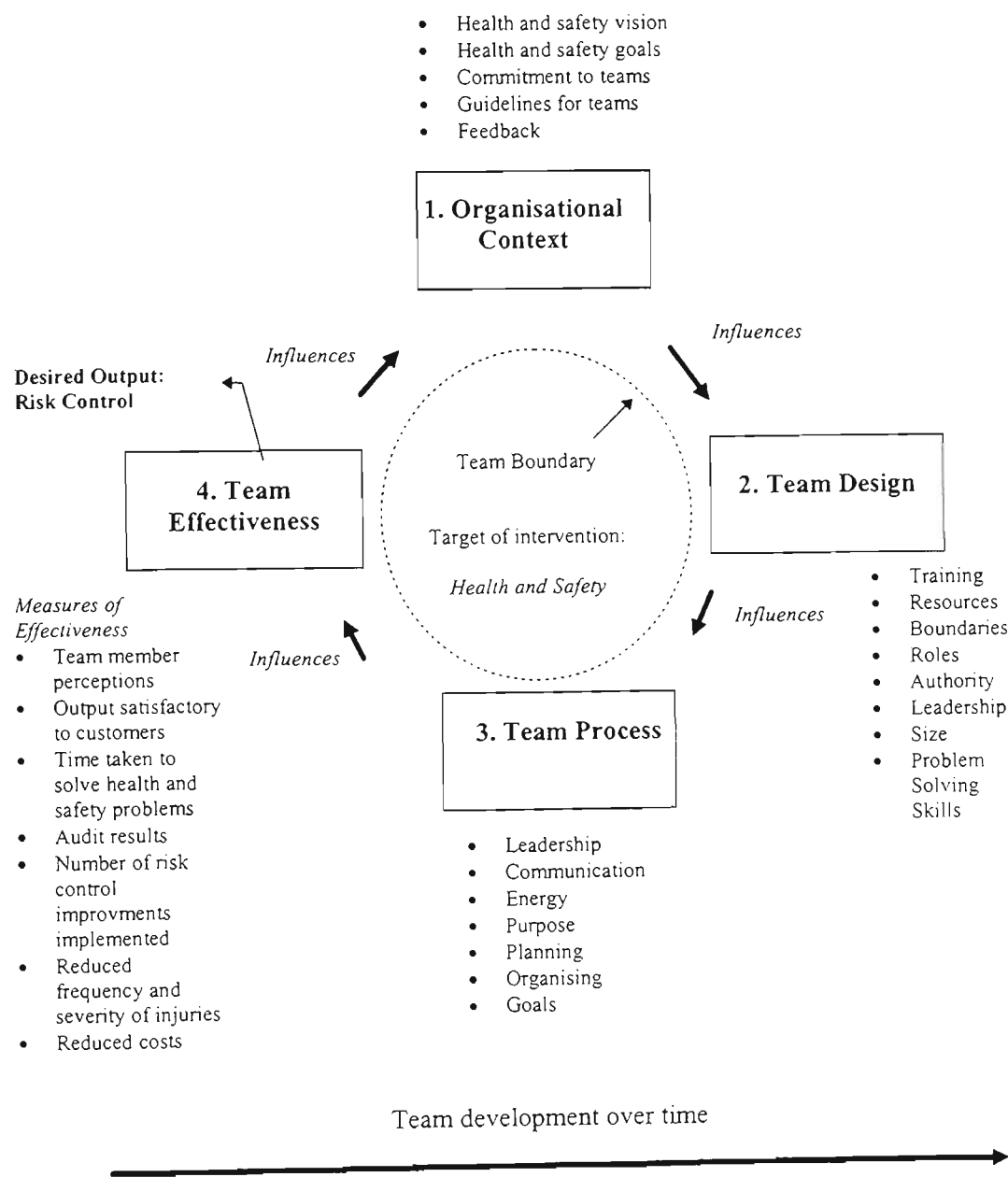
- A general increase in awareness of health and safety
- In the case of the Health Industry Team 2, the number of solutions to health and safety problems that had been implemented
- The teams' customers are satisfied with the output of the teams, but only in relation to fixing small problems

6.4 An Implementation Model for Health and Safety Teams

The literature review undertaken for this study revealed a wide range of variables that may be associated with the effectiveness of team-based approaches to work. However, none these models have been applied specifically to health and safety. By integrating and applying knowledge drawn from the case studies used in this research study coupled with aspects of some of the existing models of effective team design, the model at figure nine is proposed as a starting point for understanding how to implement effective team-based approaches to improving health and safety.

This model is designed to be a systems model in accord with Syer and Connolly's (1996) systems theory view of team work, this theory encompasses the concept of circular causality. This model has adapted Senge's (1992) systems diagrams in an attempt to model team effectiveness in health and safety. Circular causality is in turn overlaid on the temporal models proposed by Gersick (1988) and Tuckman (cited in Gersick, 1988).

Figure 9.
A Model for the Development of Effective Team-based Approaches
to Improving Health and Safety (Borys, 1998)



This model has a number of important characteristics. Firstly, the specific target of intervention is health and safety. This is based upon Cohen and Ledford's (1994, p.17) findings that the effects of teams are *limited to the direct targets of intervention* and that the design and implementation of teams may need to be different if the desired outcome is improved safety.

The model also reflects the need identified by Cohen and Ledford (1994) to establish comprehensive outcome measures. Tension remains in relation to what is meant by and the relationship between the terms 'outcome', 'performance' and 'effectiveness' relate. For example, are the terms synonymous, do effective teams produce desired outcomes? These questions remain unanswered. However, for the purposes of the model, the outcome is identified as risk control. This outcome is supported by a range of measures of effectiveness.

Hackman's (1987) measures of effectiveness are included so that the social processes of team work are recognised as being as important as hard 'output'. Therefore, it is argued that measures of effectiveness should include group members being satisfied with the group experience. Hackman's measures also take into account customer satisfaction with the output of the team (Hackman, 1987).

Hard measures of output are also used. For example, time taken to solve health and safety problems, the number of innovative solutions to health and safety problems, reduction in injuries resulting in cost savings. These could be aligned to the measures of effectiveness (performance) recommended by Dunphy and Bryant (1996) of cost, value and innovation.

The model proposes that the organisational context for teams will influence team design. For example, if the organisation has a vision for occupational health and safety is committed to both team work and health and safety, then that commitment will flow-on to the degree of authority the team enjoys and the training the team receives. Within this context, the team has some chance of succeeding, however, team process must be appropriate and the team must sustain its energy. This is consistent with Hackman's (1987) idea of *process criteria of effectiveness* as has been discussed

elsewhere in this paper. If the organisational context, team design and team processes are all strong, then the team, in theory, should be effective across a range of measures - the output of that effectiveness should be risk control. If that is the case, then the organisation is likely to remain committed to teams and maintain team resource and authority levels. Simultaneously, the team will be developing overtime.

7.0 Conclusion

This study has revealed that there are a number of types of team-based approaches open to organisations.

Some studies have concluded that team-based approaches are effective at improving health and safety. However, these studies are inconclusive, rare, and vary across industry and type of team. There are no consistent measures of effectiveness, nor have the studies produced a universally accepted model to inform the design and development of effective team-based approaches to improving health and safety.

Other researchers have developed models which attempt to predict effective team work. These models range from organisational models to individual team player style models to temporal models of team development. These models have not been applied to the study of teams with a responsibility for improving health and safety.

This study drew upon a range of variables available from previous research studies and theoretical models. This study found that self-directed work teams in the chemical industry with a responsibility for health and safety were effective. However, the effectiveness of risk improvement teams in the health industry varied, one team was effective whilst the other was not.

This study concludes that team-based approaches to improving health and safety are generally effective.

However, to assist organisations implementing team-based approaches to improving health and safety, this study has drawn together existing and original research knowledge to inform the development of a model to assist organisations to implement effective team-based approaches to improving health and safety.

8.0 Recommendations

The following recommendations are made in relation to research that needs to be undertaken to further the research effort into the effectiveness of team-based approaches to improving health and safety in Australian organisations and organisations world-wide.

1. The model for the implementation of effective team-based approaches to improving health and safety should be tested in a longitudinal study to determine the validity and reliability of the model to predict effective team work.
2. Further research is required to identify and apply consistent measures of team effectiveness.
3. Further research is required to determine the variables supporting or detracting from effective team work, by type of team. In particular, the impact of competing pressures upon the time of self-directed work teams requires further study.
4. Further research is required to determine the type of activities that teams can reasonably be expected to carry out.
5. Further research is required to determine if, over time, teams are more effective than other consultation structures such as health and safety representatives and health and safety committees.
6. Consideration should be given to amending occupational health and safety legislation so that it reflects contemporary approaches to work organisation such as team-based approaches.
7. Further research is needed in relation to conducting focus groups in organisations.

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Appendix A

Focus Group and Semi-structured Interview Questions

Chemical Industry: Team Focus Group Questions

Type of Question	Question
Opening	1. Please introduce yourself, your position on the team and how long you have been on the team.
Introductory	2. How long has the team been together? 3. Overall, what sort of things has the team been made responsible for, and what is your overall purpose and goals?
Transition	4. What are your purpose and goals in relation to OHS, and how do you measure your OHS performance? 5. What OHS activities are you responsible for, and how do you plan for and organise those activities? 6. How well is OHS able to compete against your other areas of responsibility? 7. How do you solve OHS problems, and to what extent can you implement solutions to OHS problems?
Key	8. How successful do you think the team has been at improving OHS, do you have examples of improvements that the team has made? 9. What factors, at either the team or organisational level, would you say have helped, or hindered, the team in carrying out its work in relation to OHS? 10. Do you think that the team-based approach to improving OHS has achieved more than individuals acting alone? 11. Have you enjoyed working on the team and would you work with other teams in the future?
End	12. How would you sum up the effectiveness of the team in relation to improving OHS? 13. What advice would you give to anyone establishing a new SDWT with a responsibility for OHS? 14. Is there anything that you would like to add that I may have missed?

Chemical Industry: Customer Focus Group Questions

Type of Question	Question
Opening	1. Please introduce yourself and your position here at work.
Introductory	2. What is the role of the OHS Best Practice Board, and how does it relate to the teams?
Transition	3. What do you think is the role and purpose of the teams in relation to OHS, and how do you measure their performance?
Key	<div>4. How successful do you think the teams have been at improving OHS, do you have examples of improvements, that is, what have the teams achieved that has made the workplace safer?</div> <div>5. What factors, at either the team or organisational level, would you say have helped, or hindered, the teams in carrying out their work in relation to OHS?</div> <div>6. Do you think that the team-based approach to improving OHS has achieved more than individuals acting alone?</div>
End	<div>7. How would you sum up the effectiveness of the teams in relation to OHS?</div> <div>8. What advice would you give to anyone establishing a new SDWT with a responsibility for OHS?</div> <div>9. Is there anything that you would like to add that I may have missed?</div>

Chemical Industry: OHS Person Semi-Structured Interview Questions

1. Why did the organisation move to a team-based approach to improving OHS?
2. Has the organisation been subject to change, if so, what impact has change had on the teams?
3. How many teams are there, and in what areas?
4. What are the organisations OHS goals and how does the team help the organisation achieve those goals?
5. How did you go about the process of implementing and developing the teams?
6. To what degree are the teams responsible for OHS, what sort of OHS things do they do?
7. What other systems are in place for improving OHS?
8. How does the role of the OHS representative work in a team environment?
9. Who is responsible for providing "training, information and instruction" to the team under the Duty of Care section of the Act?
10. How well is OHS able to compete with other team priorities eg. Production etc?
11. How do you maintain OHS standards in team environment where the team has greater control over its work and perhaps has the ability to downgrade standards, perhaps to suit productivity needs?
12. What is your role in relation to the team?
13. What obstacles have the teams encountered?
14. How successful do think the teams have been?
15. What makes a team successful?

Health Industry: Team Focus Group Questions

Type of Question	Question
Opening	1. What is your job title and in which area do you work?
Introductory	2. How long has the team been together? 3. How are people recruited onto the team, for example, were you elected, did you volunteer etc.?
Transition	4. What is the teams purpose and goals, and how do you measure your performance? 5. What OHS activities are you responsible for, and how do you plan for and organise those activities? 6. How do you solve OHS problems, and to what extent can you implement solutions to OHS problems?
Key	7. How successful do you think the team has been at improving OHS, do you have examples of improvements that the team has made? 8. What factors, at either the team or organisational level, would you say have helped, or hindered, the team in carrying out its work? 9. Do you think that the team-based approach to improving OHS has achieved more than individuals acting alone? 10. Have you enjoyed working on the team and would you work with other teams in the future?
End	11. How would you sum up the effectiveness of the team? 12. What advice would you give to anyone establishing a new RIT? 13. Is there anything that you would like to add that I may have missed?

Health Industry: Customer Focus Group Questions

Type of Question	Question
Opening	1. What is your job title and in which area do you work?
Introductory	2. Do you know who is on the RIT in your area and how to bring issues to the attention of the RIT? 3. How does the RIT keep you informed of its activities? 4. Apart from the RIT's, what other avenues are available to you to raise OHS issues?
Transition	5. What do you think is the role and purpose of the RIT's?
Key	6. How successful do you think the RIT's have been at improving OHS, do you have examples of improvements, that is, what have the RIT's achieved that has made your workplace safer? 7. What factors, at either the team or organisational level, would you say have helped, or hindered, the RIT's in carrying out their work? 8. Do you think that the team-based approach to improving OHS has achieved more than individuals acting alone?
End	9. How would you sum up the effectiveness of the RIT's? 10. What advice would you give to anyone establishing a new RIT? 11. Is there anything that you would like to add that I may have missed?

Health Industry: OHS Person Semi-Structured Interview Questions

1. Why did the organisation move to a team-based approach to improving OHS?
2. How many teams are there, and in what areas?
3. How did you go about the process of implementing and developing the teams?
4. What are the organisations OHS goals and how does the team help the organisation achieve those goals?
5. What other systems are in place for improving OHS?
6. What is your role in relation to the team?
7. What obstacles have the teams encountered?
8. How successful do you think the teams have been?
9. What makes a team successful?
10. Has the organisation been subject to change, if so, what impact has change had on the teams?

Appendix B

Statement for Potential Participants

Master of Applied Science (OHS) Research Project

Statement for Potential Participants

Title of Project

The effectiveness of team-based approaches to improving health and safety: Case studies from Australian industry in the 1990's.

Aim of Project

Using case studies from Australian industry, the aim of this research project is to study team members' and their customers' perceptions of the "effectiveness" of team-based approaches to improving health and safety, and to identify the organisational and team factors that support effective teamwork.

Researcher

David Borys

Research Supervisor

Associate Professor Steve Cowley

Statement

This research project requires you to participate in a focus group meeting moderated by the researcher. The researcher will ask the group a series of questions. It is anticipated that the answers to the questions will generate discussion between participants, and the researcher.

The purpose of the focus group is gain your perceptions of the effectiveness of the team based approach in relation to improving OHS. There are no right or wrong answers!

The focus group is scheduled to last no longer than one hour. The focus group will be held on-site at your organisation during working hours.

With the consent of the group, the meeting will be tape recorded.

If you do not feel comfortable expressing your views at the meeting, you may leave the meeting and/or arrange an individual interview with the researcher.

The following conditions apply to this research project:

- your participation is voluntary
- all data will be kept confidential
- your anonymity will be protected during data analysis
- your written consent will be required