MEASURING SAFETY CULTURE IN THE AUSTRALIAN REGIONAL AIRLINE INDUSTRY: THE DEVELOPMENT OF THE AIRLINE SAFETY CULTURE INDEX (ASCI)

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Abstract- The recognition of the integral role that human and organisational factors play in accident causation has led to a recent focus on identifying the elements that best represent safety culture. However, previous attempts to measure safety culture have produced disparate results and have been criticised for a lack of theoretical grounding. Subsequently the aims of the present study were, to develop a safety culture instrument as a means of evaluating the usefulness of an airline safety management program called INDICATE, and to provide the airline industry with a practical tool to regularly measure safety culture. A 25 item self administered questionnaire was developed, based upon previous measures, and distributed to 150 regional airline employees on three separate occasions over a 16 month period. Factor analysis revealed the predominance of one factor labelled safety information with a second more moderate factor labelled safety reporting. In an effort to develop a brief scale for further application, items with high item total correlation’s and factor loadings were retained. This 10-item scale was then distributed to 642 employees from 42 regional airlines of varying size. Again factor analysis revealed one dominant factor which consisted of items comprising the previous safety information factor. Results indicated that the necessary conditions for creating a good safety culture involve ensuring that employees are knowledgeable about current company safety issues and are given sufficient opportunity to voice any safety concerns. The results also suggested that smaller size airlines appear to have a better safety culture than larger operators and that safety culture is a useful measure to determine the effectiveness, over time, of a safety management program.

1. Introduction

The recent focus on the influential role of management in accident causation has led to considerable interest in the concept of safety culture.\textsuperscript{1} In the aviation industry a number of accident reports (Moshansky, 1992; Bureau of Air Safety Investigation, 1994; 1995) have implicated operators and regulators for failing to foster an effective safety culture. Recent papers on the subject (Reason, 1997; Hudson, 1997; Ginnett, 1997) have...
1997; Edkins, 1998a) suggest that the establishment of a good safety culture will encourage safe behaviour and minimise the risk of accident occurrence.

Attempts to more clearly understand the concept of safety culture can be broadly categorised into two different approaches. The first approach may be called the industrial view of safety culture, which relies on industry experience and accident statistics to identify what elements distinguish good from poor safety cultures. The second approach is more academic and is based on conducting empirical research in an attempt to develop methods that can measure the concept.

The industrial view of safety culture suggests that the concept involves more than simply encouraging employees to change their attitudes toward safety. Rather, it is equally important to implement strategies that motivate employees to gather and assess potentially dangerous hazards. For example, the International Civil Aviation Organisation (ICAO, 1992) suggests that a good safety culture is made up of the following attributes:

- senior management placing a strong emphasis on safety;
- staff having an understanding of hazards within the workplace;
- senior management’s willingness to accept criticism and an openness to opposing views;
- senior management fostering a climate that encourages feedback;
- emphasise on the importance of communicating relevant safety information;
- the promotion of realistic and workable safety rules; and
- ensuring staff are well educated and trained so that they understand the consequences of unsafe acts.

1 For the purpose of this article, the term safety culture will be used. However, it should be noted that safety culture and safety climate are terms that are used interchangeably within the literature and
In the academic arena, there have been many attempts to develop methods to measure safety culture. However, there is still considerable debate about whether the concept is generated by specific workplace characteristics or by employee attitudes about safety (Williamson, Feyer, Cairns & Biancotti, 1997).

The first reported research in the area of safety culture was conducted by Zohar (1980), who in reviewing the literature and accident rate statistics, attempted to determine what factors distinguish organisations with good and poor safety performance. Zohar identified eight factors, and subsequently developed a 49-item questionnaire to assess safety performance. These factors included: perceived importance of training programs, perceived management attitudes to safety, perceived effects of safe conduct on promotion, perceived level of risk within the workplace, perceived effects of required work pace on safety, perceived status of the safety officer, perceived effect of safe conduct on social status and perceived status of the safety committee. Nine items were removed from the original 49-item scale and a revised 40-item questionnaire was administered to 20 production workers within a number of different workplaces. The results demonstrated that organisations have quite distinct safety cultures with two factors being most important for identifying workplace differences: perceived relevance of safety to job behaviour; and perceived management attitude to safety.

Since Zohar’s initial work, a number of researchers (Glennon, 1982; Brown and Holmes, 1986; Dedobbeleer and Beland, 1991; Seppala, 1992; Glendon, Stanton and Harrison, 1994; Cooper, 1995; DeJoy, Murphy & Gershon, 1995) have developed additional safety culture instruments. However, results have differed widely on the number (2-11) and types of factors identified. For example, Dedobbeleer and Beland discussions with experts in the field suggests that there is very little that distinguishes one from the other.
(1991) identified the following two broad factors: management commitment to safety and employee involvement in safety. In contrast, Glendon, Stanton and Harrison (1994) identified eleven factors which are representative of much more specific employee workplace perceptions such as work pressure, procedures, relationships, investigations and personal protective equipment.

Other studies (Cox and Cox, 1991; Donald, Cantaer and Chalk, 1991; Niskanen, 1994) utilising attitudinal survey methods have produced disparate results in attempting to identify the important elements that constitute safety culture. Results have ranged from three (Donald et al 1991) to four factor solutions for management and employees (Niskanen, 1994).

According to Williamson et al (1997) two factors appear to be reflected consistently across the majority of studies undertaken: management attitude toward safety; and employee involvement and/or attitudes to safety. Despite this finding, no further agreement exists regarding the dimensions that comprise safety culture. Niskanen (1994) suggests that this is due, in part, to relatively little cross matching of data from previous studies and a lack of studies, which base their work on established theory.

Dissimilar results of this kind are not surprising considering the different aims of various studies and varying types of response formats used. For example, the work of Cox and Cox (1991) and Donald et al (1991) was concerned with general employee attitudes about safety, whereas Brown and Holmes (1986) focused on specific employee perceptions about the state of safety within a workplace. Various types of scales used include the visual 9 point analogue scale with descriptors of “never”, “sometimes” or “always” (Glendon, Stanton and Harrison, 1994), to a combination of 3-5 point likert scale formats (Zohar, 1980; Dedobbeleer and Beland, 1991).
From the studies reviewed above, it is clear that further safety culture research is needed to better understand the significant elements that determine this concept. In addition, discussions with various sectors of the Australian aviation industry suggests that a practical tool to measure airline safety culture may assist passenger carrying operators in identifying areas where safety improvements are required (Edkins & Brown, 1996).

The present research consisted of two studies. The objective of Study 1 was to develop a safety culture measure as a basis for determining the effectiveness of an airline safety management program called INDICATE (Edkins, 1998b; 1997). It was evident at the time of the present study’s design that there was a lack of theoretically sound and methodologically reliable instruments available to measure safety culture. Therefore, rather than relying on existing measures, a new instrument was developed based on the findings of previous research (Cooper, 1995; Dedobbeleer and Beland, 1991; Brown and Holmes, 1986) and from experiences within the aviation industry (ICAO, 1992). It was hoped that the longitudinal nature of this study would demonstrate the usefulness of safety culture in measuring the effectiveness of a safety management program and provide further insights into the dimensions that constitute safety culture over a sixteen month period.

The objective of Study 2 was to develop a brief, but practical version of the safety culture instrument so that it could be more easily applied by operators to regularly monitor a company’s safety culture. Previous research (Williamson et al, 1997) suggests that safety culture is largely a uni-dimensional concept, therefore a short scale may provide a more useful and reliable tool in situations where employees have limited time to complete lengthy questionnaires. Furthermore, in the Australian regional airline
industry, history has consistently demonstrated that it is with smaller operations (e.g. less than 10 seats) where fatal accidents are more likely to occur. It was expected that administering the short scale to a number of different size operators within the regional industry would reveal differences in safety culture among operators of varying size and that safety culture may also vary across different occupational groups within the industry.

2. Method - Study 1

2.1 The development of the ASCI

The Airline Safety Culture Index (ASCI) was developed to measure safety culture specifically within the regional airline industry. The instrument consisted of 25 positively worded statements, each requiring a response on a five point likert scale ranging from strongly agree to strongly disagree. Based upon a review of previous research, cited above, items developed were based on the following core dimensions: management commitment (2 items); management action (6 items); employee commitment (4 items); level of perceived risk (1 item); beliefs about accident causation (2 items); emergency procedures (1 item); the provision of safety training (2 items); and safety communication (7 items). Prior to administering the questionnaire, a draft was given to 10 safety professionals within the aviation industry with varying backgrounds ranging from psychology, engineering, air traffic control and pilots from commercial, military and airline backgrounds. Based on these responses minor modifications were made to instrument items to improve clarity and comprehension.

Identifying Needed Defences In the Civil Aviation Transport Environment.
2.2 The development of the INDICATE safety management program

The INDICATE program is a proactive safety management program, which was developed specifically for regular public transport (RPT) and aviation charter operators to improve the way safety hazards are addressed within an airline. The program provides a simple but structured process to ensure consistent and high quality safety feedback is regularly communicated to all airline staff. This is achieved through the following six core safety activities:

1. conducting a series of staff focus groups to proactively identify safety hazards within the airline;
2. establishing a confidential safety reporting system;
3. conducting monthly safety meetings with management;
4. maintaining a safety information database;
5. electing an operational safety officer who is available to staff as a confidante for safety related issues; and
6. ensuring that safety information is regularly distributed to all staff.

2.3 Sample and study design

A time series with non-equivalent control group design was used to evaluate the INDICATE program. Cooperation was gained with a major Australian regional airline
that operates out of two regional centres. The INDICATE program was implemented in one regional centre (intervention group) for a sixteen month period while the other regional centre received the program at the eight month stage of the sixteen month trial (delayed intervention group).

The ASCI was administered on three separate occasion’s to both groups; prior to the implementation of INDICATE (time 1, pre-intervention); at the eight month stage of the trial (time 2, post-intervention); and at the end of the sixteen month trial period (time 3, delayed-intervention).

**Time 1, pre-intervention administration**

The ASCI was distributed to all 180 employees within the intervention and delayed intervention groups. Employees within the intervention group were requested to complete their questionnaire prior to them participating in a safety focus group. The questionnaire was distributed personally to employees within the delayed intervention group by the base safety officer. Employees were requested to return the completed questionnaire in a free post envelope provided. Participants were asked to write a code on the top right of their questionnaire, so their responses could be matched at times 2 and 3. 153 questionnaires were returned indicating an 85% response rate.

**Time 2, post-intervention administration**

The post-intervention administration occurred 32 weeks (eight months) after the pre-intervention. The questionnaires were personally administered to all 180 employees with a requirement to return it to the base safety officer or mail it to a post office box in the free post envelope provided. 151 questionnaires could be matched to time 1.
Following the two week return period, the delayed intervention group received the intervention.

*Time 3, delayed-intervention administration*

The delayed-intervention administration occurred 64 weeks (sixteen months) after the pre-intervention and again was administered to both groups. The same method was used to distribute and collect the questionnaires as was outlined at Time 2. A total of 150 questionnaires were able to be matched from time 1 and time 2.

**3. Results**

**3.1 Reliability**

Reliability analysis conducted on the questionnaire items indicated a Cronbach’s alpha reliability coefficient of .9350 at time 1, .9647 at time 2 and .9301 at time 3. Item 16; “managers recognise when employees are working unsafely”, revealed a consistently low item total correlation. Removing this item saw an improvement in alpha to .9422 at time 1, .9707 at time 2 and .9338 at time 3.

Test-retest reliability was used to evaluate the error associated with administering the ASCI at different points in time. According to Kaplan and Saccuzzo (1988) the test-retest reliability method is only of value for the measurement of stable traits. In the present study, safety culture as measured by the ASCI, is expected to improve in the intervention group but remain relatively stable in the delayed intervention group prior to the implementation of the safety management program. Therefore, results for the delayed intervention group indicated a Pearson’s correlation of $r = .601$, $p < .01$ at time 1 and $r =$
.643, p < .01 at time 2 suggesting reliability of the measure over the two time periods. Following the intervention the reliability increased to r = .955, p < .01 at time 3.

3.2 Factor Analysis

In order to determine the underlying constructs of the safety culture index, a principal axis factor analysis with oblique rotation was conducted. To determine the consistency and stability of the factor structure over time, factor analysis was conducted on three separate occasions over a sixteen month period. Oblique rotation was chosen to increase interpretability of the factor solution, as it was expected that the extracted factors would be correlated. Prior to analysis the data was screened for the presence of outliers, absence of multi-collinearity and factorability of the correlation matrix. In relation to factorability of the correlation matrix, a Kaiser-Meyer-Olkin measure of sampling adequacy of .91485 was obtained at time 1; .95963 at time 2; and .92251 at time 3. Tabachineck and Fidell (1989) suggest that any value greater than .6 is required for good factor analysis. In addition, the Bartlett Test of Sphericity was significant on all three occasions. Table 1 summarises the factor analysis results for Time 1 and assigns labels to those factors obtained with eigenvalues greater than 1.

Table 1.

<table>
<thead>
<tr>
<th>TIME 1</th>
<th>Factor 1: Safety Information (41.0%)</th>
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<tbody>
<tr>
<td>v21  Everyone is given sufficient feedback regarding the company’s safety performance</td>
<td>.70</td>
<td></td>
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<tr>
<td>v9   All new employees to the company are provided with sufficient safety training before commencing their work</td>
<td>.66</td>
<td></td>
</tr>
<tr>
<td>v22 Managers regard safety to be a very important part of all work activities</td>
<td>.62</td>
<td></td>
</tr>
<tr>
<td>v1   Employees are given enough training to do their work tasks safely</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>v11 Everyone one is kept informed of any changes within the company that may affect safety</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>v10 Managers often praise employees they see working safely</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>v24 Safety within this company is generally well controlled</td>
<td>.54</td>
<td></td>
</tr>
<tr>
<td>v15 Accident investigations attempt to find the real causes of accidents, rather than just blame the people involved</td>
<td>.47</td>
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</table>
At Time 1, two factors with eigenvalues greater than 1 were extracted using an Oblique rotation. Factor 1 was comprised of 12 items with factor loadings ranging from .40 to .70 explaining 41.0% of the variance. This factor was labelled safety information and consisted of items relating to the provision, distribution and awareness of information about organisational safety management. Factor 2 contained 5 items with factor loadings ranging from .38 to .67 and explained 4.8% of the variance. It was labelled safety reporting as it was made up of items relating to the identification and reporting of safety hazards.

Table 2 summarises the factor analysis results for Time 2. One factor was extracted which accounted for 56.8% of the variance. This factor was labelled safety information/reporting as it was comprised of a combination of the same items that were previously extracted at Time 1. The factor consisted of 17 items with factor loadings ranging from .44 to .74.
Results of the Time 3 factor analysis showing the name of each factor, percentage of variance accounted for by each factor and factor loadings are shown in Table 3.

Table 3.

<table>
<thead>
<tr>
<th>Factor 1. Safety Information (36.8%)</th>
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<tbody>
<tr>
<td>v9 All new employees to the company are provided with sufficient safety training before commencing their work</td>
<td>.70</td>
</tr>
<tr>
<td>v2 Managers get personally involved in safety activities</td>
<td>.67</td>
</tr>
<tr>
<td>v24 Safety within this company is generally well controlled</td>
<td>.61</td>
</tr>
<tr>
<td>v22 Managers regard safety to be a very important part of all work activities</td>
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</tr>
<tr>
<td>v21 Everyone is given sufficient feedback regarding the company’s safety performance</td>
<td>.61</td>
</tr>
<tr>
<td>v1 Employees are given enough training to do their work tasks safely</td>
<td>.60</td>
</tr>
<tr>
<td>v4 Managers often discuss safety issues with employees</td>
<td>.59</td>
</tr>
<tr>
<td>v11 Everyone is kept informed of any changes within the company that may affect safety</td>
<td>.57</td>
</tr>
<tr>
<td>v10 Managers often praise employees they see working safely</td>
<td>.57</td>
</tr>
<tr>
<td>v19 Managers stop unsafe operations or activities</td>
<td>.51</td>
</tr>
<tr>
<td>v15 Accident investigations attempt to find the real causes of accidents, rather than just blame the people involved</td>
<td>.47</td>
</tr>
<tr>
<td>v23 Safety audits are carried out frequently</td>
<td>.44</td>
</tr>
<tr>
<td>v17 Any faults or hazards that are reported get rectified promptly</td>
<td>.40</td>
</tr>
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<table>
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<tr>
<th>Factor 2. Safety Reporting (4.7%)</th>
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<tr>
<td>v20 After an accident has occurred, appropriate actions are usually taken to reduce the chances that a similar event will occur in the future</td>
<td>.75</td>
</tr>
<tr>
<td>v14 Managers do all they can to prevent accidents here</td>
<td>.52 ***</td>
</tr>
<tr>
<td>v8 Managers are aware of the main safety problems in the workplace</td>
<td>.43</td>
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Key: *** Items that only appear at T2 and T3
Time 3, revealed two factors that were again labelled safety information and safety reporting accounting for 36.8% and 4.7% of the variance respectively. These two factors mirrored the factor structure extracted at Time 1. Factor 1 comprised 13 items with factor loadings between .40 to .70 and factor 2 was made up of 3 items with factor loadings ranging from .43 to .75.

4.0 Discussion

The data collected from Study 1 suggests that safety culture is largely a unidimensional concept dominated by a safety information dimension and to a lesser extent a factor related to safety reporting. The two factors generated are a combination of employee attitude and knowledge about safety and the behaviour of employees in maintaining an acceptable level of safety. The factor and reliability analyses suggest an internally consistent and well defined factor structure over time.

However, there is little similarity between the two factors generated in this study and previous studies. The majority of studies (with the exception of Dedobbeleer and Beland, 1991) have identified more than two factors in relation to safety culture, with each factor relating to a very specific safety activity (e.g. personal protective equipment, effect of work pace on safety) rather than broad or more general factors, as suggested by the present study.

The findings of this research are intriguing in that the attitudes that make up safety culture appear to be not only shared by organisational members but also consistent over time. On an individual level the concept is reflected in workers having access to and being aware of relevant safety information, and their willingness or motivation to report safety problems. Support for these findings can be found from recent comments by Reason
(1997) who suggests that there are two important elements that reinforce a good safety culture; an informed culture and a reporting culture. The first involves all organisational members having current knowledge about the factors that determine the safety of the system as a whole. The second involves fostering an environment in which employees are prepared to report safety hazards.

Furthermore, there appears to be a link between the essential elements that constitute a safety management program and safety culture improvement. The INDICATE program is a proactive safety information system and by its very nature reinforces the two broad factors identified by the present study. For example, the safety feedback initiatives and regular focus group processes provide employees with information regarding the state of safety within the organisation. Employees are therefore continually informed about their safety responsibilities, rights and obligations. The confidential reporting system and the appointment of a safety officer, who can act as a confidante, provides employees with the confidence that any safety issue will be managed efficiently, confidentially and that feedback will be provided regardless of outcome.

Further support for the notion that attitude surveys can be used to measure safety performance comes from an extensive study conducted by Bailey and Peterson (1989) in the U.S railroad industry. Railroads with better safety performance (reduced workplace accidents and incidents) had more positive scores on a questionnaire which measured employee attitudes to safety, communication within the organisation, goals for safety performance, hazard corrections, discipline for safety, involvement of employees in safety and attitude to those violating safety rules.

A number of studies have also examined the relationship between safety culture and safety management programs. Zohar (1980) found relatively high agreement between the quality of workplace safety programs, ranked by independent safety inspectors, and safety
culture scores. Bailey and Peterson (1989) also concluded that a safety culture survey can identify the strengths and weaknesses of a safety program. Similarly Dedobbeleer, Beland and German (1990) found relationships between safety culture and those organisational factors prevalent in most safety programs (safety meetings, safety training and communication of safety information).

Other studies have focused on the relationship between safety culture and quality. For example, Gaunt (1989) examined the impact of safety culture on organisational quality by assessing 173 workplace sites using 34 organisational performance factors. Those with more positive safety attitudes appeared to have better overall work methods and reduced absenteeism. Furthermore, Williams (1991) also concluded that fostering an effective company safety culture may result in improved overall quality performance.

In relation to accident rates, Glennon (1982) found that organisations with poor safety culture scores had higher accident rates than those organisations with better safety culture scores. In support of this finding, Guest, Peccei and Thomas (1994) in studying British Rail’s safety culture following the Clapham Junction Rail Disaster (Hidden, 1987), found a more positive safety culture (attitude toward safety and safety consciousness) in those sections of the company that experienced lower workplace accident rates.

In summary, the results of this study and those reviewed above suggest that measuring safety culture provides a useful method to monitor changes in company safety performance and assist in identifying elements of a safety management program that require improvement (e.g. a hazard reporting system).

5.0 Study 2 - Method
In the interests of developing a short version of the ASCI, the 25 item scale was shortened by removing items with relatively low item total correlation’s and factor loadings. Those 10 items with the highest scores were retained.

5.1 Sample

The final 10 item scale was administered to 2,000 employees working within the Australian regional airline industry. 42 companies were selected for inclusion in the study. These companies represent all airlines that are licensed to conduct low capacity regular passenger transport (RPT) operations within Australia. Companies ranged in size from those that operated aircraft with less than 10 seats, those with between 10-19 seats and those with a seating capacity of up to 38 seats. No individual or company names were required on the questionnaires. Participants were required to return the completed questionnaire in the sealable envelope provided. Responses were obtained from 642 employees, representing a 32% response rate.

6. Results

Reliability analysis conducted on the questionnaire items indicated a Cronbach’s alpha reliability coefficient of .9408. Factor analysis revealed one dominant factor, which comprised all the 10 items with factor loadings ranging from .41 to .72. This factor explained 61.9% of the variance and was labelled safety information as it contained most of the items that had loaded previously in the long version of the scale. Factor loading for the 10 items are shown in Table 5.
Table 5.

<table>
<thead>
<tr>
<th>Regional airline industry</th>
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<tbody>
<tr>
<td>Factor 1: Safety Information (61.9%)</td>
<td></td>
</tr>
<tr>
<td>v24 Safety within this company is generally well controlled</td>
<td>.72</td>
</tr>
<tr>
<td>v14 Managers do all they can to prevent accidents here</td>
<td>.70</td>
</tr>
<tr>
<td>v11 Everyone is kept informed of any changes within the company that may affect safety</td>
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</tr>
<tr>
<td>v21 Everyone is given sufficient feedback regarding the company’s safety performance</td>
<td>.58</td>
</tr>
<tr>
<td>v9 All new employees to the company are provided with sufficient safety training before commencing their work</td>
<td>.52</td>
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A one-way ANOVA was used to compare the summed scale scores across different size airlines. Results indicated a significant difference between the safety culture score of airlines operating small aircraft (less than 10 seats) and those that operate larger aircraft (up to 38 seats), F(2, 603) = 6.89, p < .001.

Safety culture scores were also compared across different job functions within the regional industry. Results of a one-way ANOVA indicate a significant difference in the safety culture of individuals in differing job positions, F(10, 605) = 4.37, p < .0001. For example, maintenance staff (LAME’s or licensed aeronautical mechanical engineers) had significantly poorer safety culture scores than all other occupational groups (pilots, cabin crew, operations staff and ground support personnel). Operations staff had the best mean safety culture score.

7. Discussion

The data collected from 614 respondents within the regional airline industry identified one dominant factor labelled safety information. This suggests that the best strategies for enhancing company safety culture should focus on ensuring that employees are given sufficient safety training and information so that they are clearly aware of their
safety responsibilities. It appears that an individual’s awareness of company safety requirements may be related to their motivation or actual involvement in safety activities. Anecdotal and accident investigation evidence within the aviation industry suggests that employees often rely on individual or private efforts to cope with safety problems rather than raise issues with management. However, the results of the present study indicate that employee’s perceive that safety is the joint responsibility of management and individual organisational members.

The short version of the ASCI appears to contain a representative group of items from the longer version and has shown to be an easily applied and useful instrument across a number of regional airlines. As with the long version, the uni-dimensional nature of the short scale suggests that employees, regardless of the company they work for, have highly similar ways of responding to the safety culture items. Similarly, Williamson et al (1997) found a high level of consensus among respondents in their answers to a broad range of safety culture items across a number of different organisations, but found little difference in relation to accident history. Future research should look at examining the relationship between incident frequency and company safety culture results. This would be useful to determine if there are more distinguishing features of safety culture between those with high and low accident/incident histories. In the present study this type of investigation was not possible for reasons of confidentiality.

The present study also examined the link between safety culture, size of operation and job position. These results provide an opportunity to discuss interventions that might be implemented to improve safety culture within specific sectors of the industry. It was expected that there would be significant differences in safety culture between airlines of varying size. The results of this study found that smaller operators indicated a significantly better safety culture. This finding appears logical in the sense that it is easier to distribute,
manage and communicate safety information with a smaller group of people. It is also easier to form and maintain closer links with management and be aware of all safety activities within a smaller organisation. This does not mean that an effective safety culture cannot be established within larger organisations. However, larger organisations require more elaborate strategies and systems (e.g. safety newsletters, regular group safety briefings) to ensure that employees are up to date with recent company safety performance.

In relation to different occupational groups, maintenance staff in this study demonstrated the poorest safety culture. This may be due to the relative neglect of this group within the aviation industry in terms of human factors and safety awareness training (Taggert, 1990). This group also tends to receive less safety-related feedback, training and are given less information and fewer prompts to encourage safety compliance (BASI, 1997). Therefore, more effort may need to be directed at this group so that they are provided with greater opportunity to participate in safety activities.

8. Conclusion

A number of important considerations are apparent from this study in regard to safety culture. First, the results clearly demonstrate that safety culture is a uni-dimensional concept where employees have highly similar attitudes or norms about the safety of their working environment. To create and maintain an effective safety culture, it is important to ensure that employees have access to relevant safety information and have sufficient opportunity to voice their safety concerns. There also appears to be a corollary between the recognised effective elements of a safety management program and safety culture. In short, a well designed safety management program is the process by which a health safety culture may be fostered.
The utility of the short version of the ASCI, in providing useful safety information to organisations, was also established. However, despite this finding, the value of safety culture instruments as commercial tools in assessing system safety has yet to be realised. This may be due, in part, to the lack of attention given and the paucity of information available to determine the economic value of safety culture on system performance. Further research in this area should address these and other issues outlined above.

References


