Management of Safety in Aviation Organizations: Challenges and Possibilities

Gurjeet K. Gill(PhD)

Aviation, like other high-risk and high-tech endeavors, relies on safety management systems for ensuring safety. The effectiveness of safety management systems depends on a number of factors. However, the most important factor would have to be the organisation's safety culture. This paper argues that organizations must maintain a positive two-way relationship between safety management systems and safety culture in order to proactively ensure safety. It also incorporates recent research in aviation operations to provide suggestions to managers, regulators, and researchers to ensure, monitor and measure safety respectively.

By *Gurjeet K. Gill(PhD)*

The Chernobyl accident, in the late '80s, triggered interest in safety management systems, and 'safety culture' became the most-talked-about term in high-tech and high-risk endeavors. It also accentuated that safety management systems alone will not ensure safety: pro-safety organizational cultural processes are critical in maximizing their effectiveness. This poses a major challenge for managers and owner-operators to create unique organizations with a type of safety culture that is capable of achieving zero accidents. A similar challenge is faced by regulators with regard to monitoring compliance in highly regulated environments such as aviation. This raises a critical question about the existing methodologies of monitoring and assessing safety through internal and external auditing systems. Should the focus be on safety management systems related 'paperwork' or on 'actual practices' described by employees at the sharp end? A similar convoluted task is also faced by researchers with regard to measurement of safety culture. Should the focus be on 'psychological' aspects, such as attitudes and values about safety, or on 'practices' and associated factors that lead to either a good or a lax safety culture?

The main aim of this paper is to a) discuss challenges faced by management in creating effective safety culture, b) identify new methods of monitoring the effectiveness of safety management systems, and c) explore novel ways of measuring safety culture.

Discussion

It is common knowledge that in high-tech, high-risk and highly regulated environments, such as aviation, safety culture plays a major role in ensuring safety. There is a multitude of definitions of the term 'safety culture'. Pidgeon and O'Leary (1994) defined it as 'the set of beliefs, norms, attitudes, roles and social and technical practices within an organization which are concerned with minimizing the exposure of individuals both within and outside an organization to conditions that are considered to be dangerous'. Safety culture researchers have argued that factors such as organizational strength in management and implementation of safety systems (Cox and Cheyne, 2000), priority given to safety matters, (Flin et. al, 1996), failure to follow procedures (McDonald et al., 1997a) play a major role in safety culture. In a recent study in aviation industry, Gill (2001) found that organisations are in constant struggle to minimize risks and maximize available resources. She identified the following organizational dynamics to be the underlying factors in aviation operations' safety culture:

Consideration of safety to be a strategic goal by top management and/or owner-operators
Allocation of resources to minimize hazards
Communication of safety concerns to all
Management to take interest in safety issues, 'walk the talk', inspire staff to be safe, uphold professional integrity, and lead by example
Provision of safety education through safety training and seminars
Availability of feedback on reported incidents/accidents to all staff
Operations staff to be safety-conscious at all times
Individuals' and organisations' focus to be on safety rather than personal or financial gains

In light of these findings, she defined safety culture as 'the outcome of an organization's ways of doing things that reflects demonstrated commitment to safety and trade-offs between safety and financial and/or non-financial gains' (Gill, 2002). The findings suggest that, by creating safety oriented organizational dynamics, safety in aviation operations could be significantly enhanced. For example, if

management is committed to safety and puts in place safety management systems, effectively implements safety policies and procedures, provides adequate resources, motivates staff, and upholds safety norms through leading by example, the organisation is likely to achieve safety targets.

The importance of safety culture and inherent organizational cultural processes in high-risk and high-tech technologies such as aviation is well documented (Reason, 1997 & 1998; Helmreich and Merritt, 1998; Maurino *et al*, 1995; Vette *et al* 2000). This means the organizations need to fully embrace safety culture and operate within the environment of 'informedness, trust and flexibility' (Hudson, 2003). From this, it is evident that the achievement of safety objectives in highly regulated environments largely depends on an organization's 'ways of doing things' - its culture that acts as the operating system. In reality this achievement may still be pending: in a New Zealand industrywide safety culture study, it has been observed that in aviation organizations, employers don't consider safety-related interactions, activities, and practices to be of very much importance in ensuring safety (Gill and Shergill, 2004). It was further revealed that the nature of aviation industry is such that managers and owner-operators must minimize all costs to keep the business running: "The aviation industry is highly competitive and as a consequence some businesses appear to be struggling to stay solvent. Competition leads to price wars that restrict the operators' ability to meet the cost of safety; it puts pressure 'to get the job done' because the opposition is seen to 'get the job done'. This produces the 'if they go, we go' culture" (Gill, 2005).

The abovementioned challenges of aviation operations must be viewed within the regulatory framework, as high-risk and high-tech endeavors tend to be highly regulated by the requirements of regulating body. Gill (2001) explored the role of regulator (Civil Aviation Authority of New Zealand) in enhancing safety culture in aviation industry. The findings suggested the need to employ several unconventional methodologies to monitor safety systems in aviation operations. For example, in order to accurately assess and monitor compliance, the auditing inspectors need to interact with employees at the 'coal face', carry out spot checks through non-scheduled visits, pay more attention to the 'real practices' rather than safety related 'paperwork' completed by safety managers, keep an eye on mavericks in the industry, and be forceful in enforcing standards and rules. The respondents strongly felt that the existing system, in which the regulator gives prior notice, does not work; the 'no warning audits' would reduce complacency as currently there is sufficient time given to 'remove or hide' all undesirable issues. It was further found that "the regulator needs to shift the focus of audits from 'what safety systems are in place' to 'whether the safety systems are being used' ". In other words, employees who carry out the actual work should be involved in the audit process. The findings suggest that the regulator must optimize its safety audit methodologies and be prepared to go 'un-announced' to accurately monitor safety practices and to educate the industry in view of lessons learned from their spot checks (Gill, 2005). In this way, the proactive role of the regulatory authority would instigate organizations and staff to be safety-conscious and exercise a duty of care.

A significant amount of research on safety culture has shown that employee attitudes and values about safety are inherent aspects of work practices. Gill provides evidence of attitudes, beliefs and practices amongst some aviation industry workers in New Zealand, that could be described contradictory to those desired in a good safety culture. Bravado and cavalier mentality, perceived invincibility, deception to save costs, often lead to unsafe acts; these are also likely to set a dangerous precedence for the next generation of pilots (Gill, 2005). On the contrary, Williams, Dobson, and Walters (1990) argue attitudes and values may or may not influence employee work behaviour. But rather it is governed by their beliefs about various situational contingencies that may affect workplace practices and their outcomes. Situational contingencies can be the available resources, rewards and costs associated with actions, the probability of success of task accomplishment, an individual's competence and knowledge, expectations and reaction of other colleagues, and support from management. In other words, beliefs governing their values and attitudes about safety, per se, may or may not be relevant to their on-job performance. It is possible that, when measured, safety attitudes and values may be 'ideal' (how things should be—professionalism) rather than 'real' (how things are—actual practices). This aspect can have measurement implications in the assessment of safety culture. As shown by Williamson *et.al.* (1997), most of the skewed items in their study were attitudinal, while skewed perceptual or reality-based questions were in the minority. A similar phenomenon was observed by Gill that depicted safety attitudes and values to be skewed towards 'positive' safety culture, whilst actual practices presented a somewhat negative view. For example, in her study, 100% of respondents agreed with an attitudinal statement that 'Most staff uphold safety values and will not knowingly jeopardize others' lives'. Whereas, only up to 50% of respondents agreed with an actual practices statement 'In operations, some people get away with violation of standard operating procedures'. In addition, when compared, management's responses portrayed a positive safety culture, but employees' responses described a somewhat dismal view. For example, whereas 100% of management staff agreed with a value statement that 'The management cares about the safety aspects of its operations', only 36% of non-management staff agreed to this. Similarly, when asked whether their employer 'Ensured resources (financial, people, technology, information, tools) are in place to do the job safely and effectively', only 50% or management staff and 45% of non-management staff agreed (Gill, 2001). This shows a discrepancy between safety related attitudes and values, and actual safety practices. It also shows that an organization's management staff is more likely to have a

positive view of operational safety than non-management personnel. It is therefore the contention of this paper that in measuring safety culture, the assessment tool should incorporate more questions about the actual safety practices-"the doing thing"-than those relating to safety attitudes and values. This, with the view that although safety attitudes and values have some bearing on ensuring safety, it is the actual practices that would accurately depict what goes on in operations. In addition, participant observation, focus groups and in-depth interviews with participants from both management and non-management positions will greatly enhance the accuracy of measurement tools.

Conclusion

In this paper, I have argued that, in order to achieve safety in high-tech and high-risk operations such as aviation, two complementary components are vital; safety management systems and safety culture. Safety management systems and inherent policies and procedures are only effective if they are put into practice in an organizational environment that is proactively managing safety with the view of reducing accidents to a zero rate. Secondly, to ensure highly regulated operations are in compliance with standard operating procedures through effective implementation of policies and procedures, regulators need to employ innovative ways of monitoring safety and incorporating knowledge obtained in this way in safety education. Finally, researchers should consider a holistic approach to measuring safety culture that includes both quantitative and qualitative methods.

Gurjeet K. Gill(PhD)
School of Aviation, Massey University, Palmerston North-833, New Zealand
Tel.: + 64-6-350-3215;
Fax.: + 64-6-350-3200;
e-mail: G.Gill@massey.ac.nz

References

Cox, S. J. and Cheyne, A. J. T. (2000). 'Assessing safety culture in offshore environments'. *Safety Science*, Vol. 34. Pp: 111-129.

Flin, R., Mearns, K., Fleming, M., Gordon, R. (1996). 'Risk perception and safety in the Offshore Oil and Gas Industry', (Offshore Technology Report OTH 94 454). HSE Books, Sudbury.

Gill, G. K. (2001). 'Exploration of safety culture in aviation: findings of a preliminary study'. Unpublished work.

Gill, G. K. (2002). 'Safety Culture in Aviation Organisations in New Zealand'. (Plenary Speaker) 21-22 October, Towards 2005, Implementing Solutions, Wellington, NZ.

Gill, G. K. (2004). 'Perception of safety, safety violation, and improvement of safety in aviation: Findings of a pilot study'. *Journal of Air Transport.* Vol. 9 (3), 43-53.

Gill, G. K. (2005). 'Management of Saftey in Aviation Industry in New Zealand'. Confidential report to Civil Aviation Authority of New Zealand.
Gill, G. K. and G. S. Shergill (2004). 'Perceptions of safety management and safety culture in the aviation industry in New Zealand'. *Journal of Air Transport Management.* Vol. 10 (4) pp. 231-237.
Helmreich, R. L., & Merritt, A. C. (1998). *Culture at work in aviation and medicine*. Aldershot: Ashgate.

Hudson, P. (2003). 'Achieving a safety culture for aviation'. *Journal of Aviation Management*, 27-48. Civil Aviation Authority of Singapore. Singapore Aviation Academy.

Maurino, D. E., Reason, J. T., Johnston, A. N., Lee, R. B. (1995). *Beyond Aviation Human Factors*. Aldershot, Avebury, London.

McDonald, N., Daly, C. Corrigan, S. (1997a). 'Task Procedures in Aircraft Maintenance' (Aerospace Psychology Research Group, Internal Report No. ADAMS-WP2B-D2.) Trinity College, Dublin.

Pidgeon, N., & O'Leary, M. (1994). 'Organizational safety culture: implications for aviation practice'. In N. Johnston, N. Mc Donald, & R. Fuller (Eds.), *Aviation Psychology in Practice* (pp. 21-43). Aldershot: Ashgate.

Reason, J. (1997). *Managing the Risks of Organisational Accidents*. Aldershot: Ashgate.

Reason, J. (1998). Achieving a safe culture: theory and practice. *Work and Stress*, 12 (3), 293-306.

Vette, G., Reason, J., Maurino, D., Kirkwood, B., Isaac, D., & O'Hare, D. (2000). *Impact Erebus*. Auckland: Aviation Consultants Ltd.

Williamson, A. M, Feyer, A. Cairns, D. and Biancotti, D. (1997). 'The Development of a Measure of Safety Climate: The Role of Safety Perception and Attitude.' *Safety Science*, Vol. 25. No. 1-3. Pp: 15-27.