

EXECUTIVE SUMMARY

Background and reasoning behind the work

While the exact rate of incidence is unknown (due to the paucity of exposure data), it is acknowledged that safety compromising accidents and incidents occur in the led outdoor activity domain, and that they represent an important issue. Despite this, compared to other safety critical domains, very little is currently known about the key causal factors involved in such accidents and incidents.

Specific research question being addressed

Initiated by the led outdoor activity sector, the aim of this research was to explore the involvement of Human Factors in led outdoor activity incidents, and to suggest and demonstrate the utility of a framework for studying such incidents. In addressing this aim, the research sought to ascertain what is currently known about the Human Factors-related causal factors involved in led outdoor activity accidents and incidents.

The current research forms the first stage of a proposed three stage research project.

Research tasks undertaken

This research involved the following tasks:

1. *Literature review.* A literature review focussing on led outdoor activity accidents and incidents was undertaken. The aim of the review was to ascertain what is currently known about such accidents and incidents, to distil the Human Factors issues which have already been implicated, to identify gaps in current knowledge, and to suggest a more comprehensive and relevant framework to aid the understanding of incident causation in the led outdoor activity sector.
2. *Exploratory case study analyses.* In order to demonstrate the potential utility of applying theoretically underpinned, systems-based accident analysis methodologies within the led outdoor activity domain, three led outdoor activity accidents were analysed using two systems-based accident analysis methods. The findings from these analyses were then compared to those derived from an analysis, which used a framework developed in the led outdoor activity domain.
3. *Workshop.* A workshop involving project stakeholders, led outdoor activity personnel, and researchers from MUARC was held in order to disseminate the research findings and to determine the most appropriate way forward for the subsequent phases of this research.

What was found?

Compared to other domains in which safety compromising accidents and incidents have been identified as a significant problem, research into accidents and incidents in the led outdoor activity domain has thus far been limited. A number of led outdoor activity accident causation models were identified, however, and the research undertaken to date suggests that there are a range of systemic and instructor/client-related causal factors involved in led outdoor activity accidents and incidents. It is notable, however, that the relationship between these factors remains unknown. Further, a universally accepted model of led outdoor activity accident

causation, and a comprehensive taxonomy of causal factors, is yet to emerge. It is also apparent that the majority of causal factors identified are instructor-based, focussing on instructor causal factors and errors as the main causes of accidents and incidents. Previous research in other safety critical domains, however, has highlighted the role of wider systemic failures in accidents and incidents.

The importance of databases in ascertaining causal factors was discussed. The literature review identified a number of National and International databases containing data regarding outdoor activity accidents and incidents. The importance of such databases in the analysis and future prevention of accidents and incidents within the led outdoor activity domain was emphasised. Three such databases were identified within Australia, and it was noted that these are voluntary, and that standardised incident reporting and storage, and analysis procedures are not currently present.

The collection and analysis of near miss incident data was also highlighted as a key commodity in the future prevention of accidents and incidents within the led outdoor activity domain. Widely accepted as a means for learning from, and preventing, accidents and incidents in most other safety critical domains, near miss incident reporting and analysis systems have been identified by many in the area as key to the prevention of future accidents and incidents (e.g. Brackenreg, 1999; Davidson, 2004, Haddock, 1999).

Main conclusions and recommendations

Current knowledge regarding the role of Human Factors in led outdoor activity accidents and incidents is limited. Although previous research has identified a range of causal factors, a lack of linkage between these factors, theoretical underpinning, and consideration of the wider systemic causal factors is apparent. A universally accepted model of led outdoor activity accident causation, and associated causal factors taxonomies, do not yet exist. Further, systems-based accident analysis models and methods, developed and applied with significant safety gains in other safety critical domains (e.g. Rasmussen, 1997; Reason, 1990), have not yet fully transferred into the led outdoor activity domain. Further research into the Human Factors issues involved is therefore required. In particular, theoretically driven, systems-based research into such accidents and incidents is advised. The following key lines of inquiry/activities are recommended:

1. Development of a unified, theoretically underpinned accident and incident reporting system;
2. Development of a National led outdoor activity accident and incident database;
3. Development and application of a theoretically underpinned, systems-based accident analysis method;
4. In-depth analysis of led outdoor activity accident and incidents; and
5. Development of a led outdoor activity accident causation model and associated failure taxonomies.

In closing, it is worth noting that the led outdoor activity industry within Australia recognises the need to further enhance their understanding of accidents and incidents so that preventative measures can be improved. This research represents the first step in that process, and the proposed phases of this overall research program will involve the tasks described above.

Whilst safety compromising accidents and incidents may never be fully eradicated, fully understanding the nature through theoretically driven research allows appropriate measures to be taken so that their likelihood and consequences can be minimised significantly.