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Under-reporting in aviation: An investigation of factors that affect reporting of
safety concerns

A thesis presented in partial fulfilment of the requirements for the degree of

Doctorate of philosophy

in

Aviation

at Massey University, Manawatu

New Zealand

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2010

Abstract

A substantial body of evidence suggests that reporting safety concerns and wrongdoing could contribute to improving safety if diligently applied within organisations. A number of aviation accidents suggest that the principles of reporting have not been embraced by the aviation industry; for example, there is evidence that aviation incidents are not always reported even when reporting is mandated by law. This thesis seeks to uncover factors influencing individuals' intentions to report safety concerns in aviation and to whom such reports might be made.

A case study of a New Zealand based example of how under-reporting in aviation may have contributed to the cause of a fatal accident was first presented as evidence of the research problem. Subsequently, four empirical studies of participants working or intending to work in the aviation industry were reported. The empirical findings provided consistent evidence of six factors (seriousness of wrongdoing, direct or indirect involvement in wrongdoing, working environment, legal protection of the reporter, motive of the wrongdoer, and relationship to the wrongdoer) that may influence both individuals' perceptions of safety issues at the workplace, and their intentions to report wrongdoing. Evidence was also found that when participants do act upon being confronted with wrongdoing situations, they may not do so in a manner that is fully consistent with improving aviation safety.

The implications of the empirical findings were discussed and a means of communicating information about what to do when confronted with evidence of wrongdoing in the aviation workplace was proposed.

In conclusion, there is confusion in the aviation workplace regarding what matters should be reported to the regulatory authorities and to whom reports should be made. Until such confusion is resolved, the notion that all aviation accidents are preventable is somewhat unrealistic.

Acknowledgements

It is my privilege to express my gratitude to the numerous persons for their part as various capacities in various stages of the completion of this thesis.

To my father, I dedicate this thesis. Although you have passed away, your lasting spirit and memories gave me the motivation and courage to complete this endeavour. I miss you and will continue to love you each and every day.

I thank my friends and family for their constant encouragement. My deepest love and respect go to my mother for her love and support.

Special thanks go to my Supervisor — Dr. Andrew Gilbey who has been a tremendous source of inspiration and engine to this thesis. He has painstakingly edited my coarse draft. My big thanks also go to Dr. Jose Perezgonzales for peer reviewing my work and for the invaluable advice given throughout my PhD journey.

I also would like to acknowledge the much-needed funding granted by the Freemasons and Massey Alumni. I am very grateful for the funding which made the thesis go smoother.

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Glossary

The following terms and their corresponding definitions are used in the context of this thesis:

Terms	Definition
AAIB (EUR)	The Aircraft Accident Investigation Board is an agency of the government of Iceland which investigates aircraft accidents and incidents.
AAIB (SIN)	The Air Accident Investigation Bureau of Singapore is an investigation authority in Singapore for air accidents and serious incidents in the country for local and foreign civil aircraft.
ASI-NET	The Aviation Safety Information network was established in Japan in 1999 to exchange confidential safety information among Japanese airlines.
ASRS (AUS)	The Aviation Self-Reporting System which replaced CAIR in Australia 2004 is a voluntary non-punitive incident reporting scheme allows Civil Aviation Authorisation holders who are seeking to claim protection from administrative action by CASA to self report unintentional regulatory breaches.
ASRS (US)	The Aviation Safety Reporting System instituted by NASA in The United States of America 1976 to promote reporting of concerns throughout the pilot, cabin crew and engineering communities.
ATCEUC	The Air Traffic Controllers' European Union Co-ordination was created in 1989 to put forward the views of European Air Traffic Controllers, and make sure that ATCOs are involved in the definition of the European ATM system and kept informed on upcoming developments.
ATCOs	Air Traffic Controllers Organisations.
ATM	Air Traffic Management.
ATSB	The Australian Transport Safety Bureau was established by the Transport Safety Investigation Act 2003 and conducts its investigations in accordance with the provisions of the Act. ATSB is an independent Commonwealth Government statutory Agency. The Bureau is managed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport.

ANSP	An Air Navigation Service Provider is an organisation that separates aircraft on the ground or in flight in a dedicated block of airspace on behalf of a state or a number of states.
BEA	The Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile BEA (Bureau of Enquiry and Analysis for Civil Aviation Safety) is an agency of the French government that was created in 1946, and is responsible for investigating aviation accidents and making safety recommendations based on what is learned from those investigations.
CAA NZ	The Civil Aviation Authority of New Zealand is the regulatory authority of civil aviation in New Zealand.
CAA Rules	The Rules are regulations, which define the minimum standards for entering and operating within the civil aviation system. The Minister, through the Ministry of Transport, contracts the CAA NZ to develop the Civil Aviation Rules and undertake consultation with interested parties. These Rules are mostly around safety and security.
CAA UK	The Civil Aviation Authority of the United Kingdom is the regulatory authority of civil aviation in the United Kingdom.
CAHRS	The Confidential Aviation Hazard Reporting System was re-launched by the South African Civil Aviation Authority in 2005 in South Africa, in an attempt to improve efficiency in the interests of aviation safety.
CAP	The Concept Alignment Process is a decision making model developed by Patankar and Taylor (2005) for Decision Making Under Varying Levels of Uncertainty in Aviation Maintenance.
CASA	The Civil Aviation Authority of Australia is the regulatory authority of civil aviation in Australia.
CHIRP	The Confidential Human Factors Incident Reporting Programme introduced in 1982 to improve safety in the UK, by providing an independent confidential reporting system for individuals employed or linked with the aviation industry (and the maritime industry).
CIRS	The Confidential Incident Reporting Scheme was introduced between 1987 and 1991 in New Zealand.
EUCARE	Safety occurrence reporting system that was introduced in 1992 in Germany and was declared unsuccessful in 1999 due to lack of full support from the aviation-community.

EUROCONTROL	The European Organisation for the Safety of Air Navigation is an intergovernmental organisation made up of 38 Member States and the European Community that was originally founded in 1960 as a civil-military organisation to deal with air traffic control for civil and military users in the upper airspace of its six founding European Member States.
FAA	The Federal Aviation Administration is the regulatory authority of civil aviation in the United States of America.
ICAO	The International Civil Aviation Organization is an agency of the United Nations established in 1947, which codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. Its headquarters are located in the <i>Quartier International</i> of Montreal, Canada.
<i>Icarus</i>	The Information Confidentially Accepted then Reported Universally for Safety was introduced between 1996 and 2001 in New Zealand.
IFATCA	International Federation of Air Traffic Controllers' Association.
IPMS	Institute of Professional Managers and Specialists.
IFR	The Instrument Flight Rules are regulations and procedures for flying aircraft by referring only to the aircraft instrument panel for navigation.
ILS	The Instrument Landing System is a ground-based instrument approach system which provides precise guidance to an aircraft approaching a runway, to enable a safe landing during meteorological conditions, such as reduced visibility due to fog, rain, or blowing snow.
KPMG	The letters K, P, M and G stand for the names of the four founding fathers of the organisation of KPMG which was founded in 1987 and is one of the largest professional services firms in the world and one of the Big Four auditors, along with PricewaterhouseCoopers (PwC), Deloitte Touche Tohmatsu (Deloitte) and Ernst & Young (EY). Its global headquarters are located in Amstelveen, Netherlands. KPMG has three lines of services: audit, tax, and advisory.
NASA	The National Aeronautics and Space Administration is an agency of the United States government established by the National Aeronautics and Space Act on July 29, 1958, and is responsible for the American civilian space program.

PRU	The Performance Review Unit was established in 1998 to support the Performance Review Commission in its task of helping to "ensure the effective management of the European ATM system through a strong, transparent and independent performance review and target-setting system". The PRU reports, for administrative purposes only, to the EUROCONTROL Director General.
REC	The Confidential Environment for Reporting was established in 2000 by BEA to facilitate reporting of minor safety events by an employee in the industry.
REPCON	Report Confidentially was implemented in 2007 as a separate scheme to ASRS (AUS) to allow any person who has an aviation safety concern to report it to the ATSB confidentially.
RCSV	The Flight Safety Confidential Report was launched by the Brazilian Aviation Safety Centre in 1997 for the prevention of accidents.
SECURITAS	The Confidential Aviation Safety Reporting Program was implemented in 1995 by TSB to allow reporting of unsafe acts or situations relating to the Canadian transportation system that would not normally be reported through other channels.
SCASS	The Sino Confidential Aviation Safety System was instituted in 2004 in China.
SINCAIR	The Singapore Confidential Aviation Incident Reporting programme was established by AAIB in 2004 to enhance aviation safety through encouraging reporting of minor incidents that would not otherwise not be reported through other channels.
SMS	Safety Management System is the specific application of quality management to safety.
SNS	The Safety Occurrence Reporting System was setup in 2007 in Spain.
TACARE	Taiwan Confidential Aviation Safety Reporting System was launched by the Aviation Safety Council of Taiwan in 1999 to promote flight safety by encouraging all personnel in the aviation community to report safety concerns.
TAIC	The Transport Accident Investigation Commission is an independent Crown entity established by Act of the Parliament of New Zealand on 1 September 1990, to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future, and may make recommendations to improve transport safety.

TSB	The Transportation Safety Board of Canada, officially the Canadian Transportation Accident Investigation and Safety Board is the agency of the Government of Canada responsible for maintaining transportation safety in Canada. The TSB was convened for the first time under the Canadian Transportation Accident Investigation and Safety Board Act, which was enacted on March 29, 1990, and is responsible for investigating accidents and making safety recommendations in several modes of transport, including aviation, rail, marine and pipelines.
VASRP	The Voluntary Aviation Safety Reporting System was introduced in 1992 in Russia.
VFR	The Visual Flight Rules are a set of aviation regulations under which a pilot may operate an aircraft in weather conditions sufficient to allow the pilot, by visual reference to the environment outside the cockpit, to control the aircraft's attitude, navigate, and maintain safe separation from obstacles such as terrain, buildings, and other aircraft.
