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**The application of the New Zealand Civil
Aviation Rule Part 115 for the regulation of
adventure aviation activities**

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(i) Abstract

Research was undertaken to examine the implementation requirements of a proposed rule, NZCAR Part 115, which has been developed with the intention to regulate “adventure aviation” activities in New Zealand. The regulation applies to a wide range of tourism focused airborne operations including the use of ex-military and aerobatic aircraft for joyriding, passenger flights in balloons, gliders, tandem parachuting and hang-gliding operations.

The rule was considered necessary as there has been a lack of any recognized safety standards applicable to these activities when they are conducted beyond a purely recreational purpose. An increasing number of operators commercialise their activities by focusing on taking passengers for rides as opposed to conducting training or “trial flights” (which are assumed to be for the purpose of introducing people to the sport). Many of these operations use non-certified aircraft which have not been intended for the carriage passengers on a commercial scale. Where paying passengers are carried, safety is assumed to require a greater level of management. The regulator – the New Zealand Civil Aviation Authority - considers that a formal system that applies standards similar to those of small airline would be more appropriate. A new rule was required due to the novel and diverse nature of activities, and the various types of aircraft used. Specialist legislation for adventure aviation would also open up the sector for further commercial opportunities and would provide the ability to regulate such activities within the civil aviation system.

The thesis includes a review of literature which examines the basis of the legislative requirements and defines the rationale for the rule-making standard, as well as introducing notions for defining and assessing risk within aviation. The review also looks at published industry reaction to the development of the Rule. A part of the research, the survey of operators, elicits their opinion as to the workability of the new legislation. The survey also tests the current level of each operator’s compliance according to a 72 point checklist of operational items and ascertains what modifications to the systems and practices are required in order to comply.

The research outcomes identified two groups of operators - one of which has standards and systems that are close to compliance with the new legislation and the other for which compliance would be difficult due to deficient systems and practices. Analysis of the differences highlighted a cultural separation of the groups in terms of their connection with mainstream general aviation and their understanding of the risk management concepts and practices required for commercial operations.

The discussion of the results of the research highlights problems with the application of the proposed regulation, particularly to the non-compliant group. Issues include the recreational origins of the sector, a lack of acceptance of the Rule by operators, and on-going problems with the consultation and collaboration in the rule-development process.

Workable compliance strategies and processes are discussed, including developing an ecological approach to managing safety as part of best practice. Recommendations look at possible strategies for implementation including the requirement for more pro-active education and enculturation processes, and the formation of a national representative body.

(ii) Attestation

I understand the nature of plagiarism, and I am aware of the University's policy on this.

I certify that this dissertation reports original work by myself

Signature

Date

(iii) Acknowledgements

I would like to acknowledge the generous contributions of

The Participants in the Survey

Monique Day – for her invaluable assistance and advice with processing of data for statistical analysis.

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(v) List of abbreviations

AC	Advisory Circular
CAA	The (New Zealand) Civil Aviation Authority
CAR	Civil Aviation Rule
GA	General Aviation
ICAO	International Civil Aviation Organisation
NZCAR	see CAR
NPRM	Notice of Proposed Rule Making
NZHGPA	New Zealand Hang gliding and Paragliding Association
NZPIA	New Zealand Parachute Industry Association
QA	Quality Assurance – see glossary
RAANZ	Recreational Aircraft Association of New Zealand
SAC	Sport Aviation Corps
SMS	Safety Management System
VOSL	Value of a Statistical Human Life

(vi) Glossary

Acceptable means of compliance - The practices and processes by which a certificate holder achieves compliance with a Civil Aviation Rule (CAR), as assessed by the regulatory authority in the certification process.

Advisory Circular (AC) - Advisory information produced by the CAA which is subordinate, and in reference to, a Civil Aviation Rule, and which contains information on methods and practices to enable an acceptable means of compliance.

Best practice – Current practice expressed as a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. Best practice is implemented according to defined technical standards and benchmarks as being the most appropriate to achieving the required outcomes. Operational best practice relates to all parts of the operation including policies and procedures, the health and safety of individuals, environmental and economic sustainability, compliance with regulatory requirements, and the promotion of continuous improvement.

Exposition - The term used by the New Zealand CAA for a written description of the organisational and operational systems for achieving an acceptable means of compliance for certification under any relevant CAR. It includes a company's operations manual.

General Aviation (GA) - The category of civil aviation that refers to flights other than military flights, or scheduled airline and regular cargo flights in aircraft greater than 5700kgs. It includes commercial and private flying.

Microlight - An category of powered aircraft having a take-off weight of less than 540kg, which are not certified under the normal airworthiness category for light aircraft. The maximum weight restriction, and a limit to no more than two occupants, allows a range of experimental light aircraft to operate without the higher specification of larger aircraft. The category was instigated to allow suitable regulatory flexibility for amateur design and construction. It further allows piloting qualifications to be issued by recreational organisations certificated under CAR Part 149.

Micro-organisations - Independent Organisations having a low work force and low level of resourcing. Micro-organisations usually have less than 5 members or employees and may have—as little as one individual member (see Appendix 3 for a description of micro-organisations as they apply to Adventure Aviation)

NZCAR Part 1 - New Zealand Civil Aviation Rule that specifies Definitions and Abbreviations

NZCAR Part 115 - the New Zealand Civil Aviation Rule currently under development that specifies requirements for the certification of commercial activities carrying out Adventure Aviation

NZCAR Part 135 - The New Zealand Civil Aviation Rule that specifies requirements for the certification of commercial activities in small aircraft (less than 5700kgs and a passenger capacity of 9 seats or less) and helicopters.

NZCAR Part 141 - New Zealand Civil Aviation Rule that specifies requirements for the certification of flight training operations.

NZCAR Part 149 - New Zealand Civil Aviation Rule that specifies requirements for the certification of recreational aviation organisations. Current 149 certificate holders are;

- Gliding New Zealand Incorporated
- New Zealand Hang Gliding and Paragliding Association (NZHGPA)
- New Zealand Parachute Industry Association (NZPIA)
- NZ Skydiving Association
- Recreational Aircraft Association of New Zealand (RAANZ)
- Sport Aviation Corp limited (SAC)
- Royal New Zealand Aero Clubs (RNZAC)
- The New Zealand Warbirds Association

Quality Assurance (QA)- The monitoring and evaluation of the various aspects of a product or service to maximize the probability that minimum standards of quality are being attained. QA cannot absolutely guarantee *quality* but is a systematic process to eliminate the obstacles to improving quality as they arise. A monitoring system may utilise testing for quality, sampling to enable quality profiling, statistical process control, and continuous improvement processes

Safety Management System (SMS) - An internationally recognised best-practice approach to managing safety and risk including the necessary systemic organisational structures, accountabilities, policies and procedures

Safety Target Outcome - Under the assumption that, in aviation, safety is outcome based, *safety target outcomes* are expressed in terms of social costs (including deaths) either over a targeted period or per seat hour

Ultrasafe - In aviation terms, “ultrasafe” describes a safety level near or beyond 10^{-6} accidents per hours flown.