A New Way to **Invest**

Rather than study a single event, or even group of events, a newly-created team of investigators is going 'big picture' to identify and mitigate safety risks. And you're going to be part of it.

You're going to hear quite a bit about 'themes and systems' investigation from now on.

A new team of investigators, using what's known as Themes and Systems Investigation Techniques (TASIT) is looking at the entire New Zealand aviation system, and even outside it, to discover what influences might be affecting safety in difference sectors.

That includes examining how the CAA, as part of the 'system', influences safety performance. That could be the rules or how the CAA engages with industry.

"The defining characteristic of the new approach is that the safety investigators will be asking for the insights and knowledge of participants to help it determine what may be the threats to safety," says team member Matt Harris.

The traditional safety investigation tries to find answers after an event. A safety investigator produces a report on why the event happened, focusing on things like the aircraft involved, the prevailing conditions, and human factors elements like decision making.

Ultimately the report reflects what the investigator determines the causes were, in that specific occurrence.

A safety analyst then gathers that information with data from other occurrences, to identify whether a trend is emerging in a particular sector and location.

That form of safety investigation, and analysis, will continue.

But TASIT will go further, aiming to identify, define and explore what issues in the wider system may also be contributing to repeated occurrences.

The work is an example of the 'systems thinking' approach coming to the fore in global aviation safety. The air navigation safety body, Eurocontrol, says:

"Most problems and most possibilities for improvement belong to the system. It is a mistake to assume that if everybody does his or her job right, it will be all right. The whole system may be in trouble.

*Improving system performance – both safety and productivity – therefore means acting on the system."**

"A simple way to understand systems thinking," says Matt Harris, "comes from an American Professor of Management Science, Dr. Russell Ackoff. If you considered a car as a simple system, and took the best engine, the best gearbox, and the best chassis, and put them together, you wouldn't necessarily have the best car. The parts may not work or fit together as they should and the car not work properly.

"Investigating why the car won't get you from A to B by testing each part on its own, will show only that each part is operating fine. But investigating the system as a whole, and looking at how one part influences the other – for example, is the engine providing power to the gearbox – will identify the problem.

"Building on this, the car itself is part of a bigger system, which involves the road it is travelling, the driver, the environmental conditions, and the road rules.

"Let's say a number of car accidents occurred where the cars had left the road at a particular bend. We may determine that all the cars were taking the corner too quickly, therefore driver decision making and speeding were the root causes. But looking from a systems thinking view, we may find that before the corner where the accidents were occurring, an advertisement billboard was installed. This advertisement had a lot of text on it,

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and required a reasonable amount of focus to read it all. The drivers' attention was thus drawn away from the approaching corner, and the ability of the driver to make the appropriate adjustment in speed was impaired.

"Therefore the outcome of the investigation may be to recommend better positioning of billboards at critical points.

"That's systems thinking."

Prototype Investigation

The first of TASIT's investigations is in full swing. It's focused on the steady and relatively high number of light helicopter occurrences in New Zealand.

On average, since 2010 there have been 13 accidents a year. Fourteen years of occurrence data has been analysed, which has uncovered a number of underlying themes and causes.

One of those themes is that many occurrences have involved the performance capabilities of the aircraft being pushed towards, or beyond, its limits.

To be sure their methodology is robust, the team has asked some overseas experts to scrutinise the *way* they have come to those conclusions, in this prototype investigation.

The next task for the team is to take the conclusions and explore what might be the underlying influences.

That is where collaboration comes in.

"It's the aviation participants themselves – the 'field experts' – who have the best knowledge about what those influences are. They live this work every day.

"The investigators want their input as it is their expertise that will provide the answers we need, and help us improve the system.

"The most effective and efficient way to get that information is to survey participants."

The survey is aimed at the helicopter sector – owners, pilots, and other relevant people like company chief executives and quality assurance managers.

The investigators have worked to make sure the online survey is straightforward and quick to answer. All responses will be anonymous.

To complete the survey, please go to www.caa.govt.nz/helisurvey.

The survey will also be emailed to all helicopter sector participants.

The executive officer of the Agricultural Aviation and Helicopter Associations, John Sinclair, says the TASIT project is a "refreshingly" new approach to the investigation of risks to safety.

"There's a wealth of accident and incident information on CAA's database. The TASIT team is using that in a proactive way to minimize repetitive accidents.

"The TASIT team is trying to identify, in a scientific way, the factors sitting behind certain safety issues, and that really is great news for the sector.

"For that reason," says John, "I hope everyone in the helicopter community gives serious thought to completing the survey, and giving honest answers." ■

The first of TASIT's investigations is focused on light helicopter occurrences in New Zealand.

* Systems Thinking for Safety: Ten Principles. A White Paper, Eurocontrol. www.skybrary.aero/index.php/Toolkit:Systems_Thinking_for_Safety:_Ten_Principles