

The Challenges of Multi-Modal investigation

Story time one



SPORTAC

Near the berth the 2 ASD tugs were made fast on bridles through panama leads fore and aft. The ship was moored to 4 and 1 each end before FWE was rung.

Story time two

The LE saw a proceed medium speed indication on Signal 1AB Up Home, allowing him to go from the Newmarket Up Main Line to the Down Main Line via No 21 points and continue to Signal 27ABC Up Directing Signal.



The LE went past Signal 27ABC displaying a proceed at normal speed indication, through Nos 19 and 35 points and on to the North Island Main Trunk Down Main Line. Signal 38 Up Directing Signal showed proceed at normal speed, telling him to be prepared to stop at the next signal in advance.

The next signal in advance was Signal 42AC displaying a proceed at low speed because another service was also berthed at the platform.

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Story time three

Passing flight level 150, the flight was cleared for the ILS/DME 05 right approach. The crew were expecting to use the higher DA as the approach landing lights had been reported as U/S on the ATIS. However, on approaching Westpoint NDB the glidepath was not captured and so the crew continued for the localiser approach. Still not stable at 500 feet, they initiated a missed approach, where minimum radar separation was lost with a departing IFR aircraft ahead. Separation was regained and the aircraft was landed without further incident.



The short stories that you have just heard are essentially the same story. Three vehicles, the ship, the train and the plane all arrived in Auckland. You will have noticed that the terminology in each is very different. One of my first challenges on taking up the Chief Investigator's role, was to learn two new "languages", in order to understand the aviation and rail speak

Some History

It is interesting to note that of the three modes of transport that the Commission looks at,



Marine is the oldest:-





Rail next:-

It might have been called "The Rocket" but it didn't fly







Followed by aviation:-

But Bleriot did





- The order in which the Commission was mandated to investigate accidents in those modes was the reverse.
- TAIC was formed in 1990 out of the Office of Air Accidents and initially only investigated air accidents. In 1993 and 1995 Rail and Marine respectively were added to TAIC's investigation mandate.







It is also true to say that aviation, industry as the relative new boy on the block, has a much more advanced safety culture than both marine and rail. This probably comes from the fact that rail operates in one dimension, marine in two, but aviation has to contend with three dimensional movement – so much more to go wrong with a greater potential for a tragic outcome.

In its formation, the aviation industry may have looked for guidance from the other modes and would have found it lacking.

Size Does Matter

One of the first challenges of multi modal investigations was faced by the New Zealand Government. In setting up an independent safety investigator, one of the question was "how big?"

There were several models to take example from:

The independent investigator does all safety investigations across the modes

Separate, but coordinated, agencies investigate everything in individual modes

One agency, or separate agencies, investigate only the more significant accidents

No doubt there were other options considered





In the event, New Zealand chose to form the Commission, devolving from the MoT **Office of Air Accidents.** The Commission was to investigate most air accidents, but there were some limitations. As the **Regulatory functions in Air, Rail and** Marine transport also separated from the MoT, and as the other modes were added to the Commission's mandate - so too did the legislation and the expectation of what was to be investigated, and by whom, change.

What we have ended up with can only be described as small, given too that we are a small country with correspondingly small transport industries.

The Commission investigates only those accidents and incidents that it considers are significant for transport safety.

Those occurrences that the Commission chooses not to investigate are investigated by the relevant Regulator, CAA, LTNZ or MNZ.

The Commission is independent of the Regulators and the Police.



Current Commission Structure



The Challenges created by the set-up

What to investigate?

The decision, ultimately resting with me, as to what is "significant for transport safety" can be a difficult one, although some are very obvious.

What can be very significant for those involved in an accident, is not necessarily significant for transport safety.

The Commission has criteria, developed over many years, that we use in deciding whether or not to launch an investigation.



Selection Process:

Is it an accident or serious incident?

(definitions from various legislation, ICAO, IMO etc)

If not, generally no investigation.

Allocate Priority:

(actual or potential severity of consequences – based on people numbers)

If high priority (1, 2 or 3) – investigate

If priority 4 – exploratory investigation

If priority 5 – no investigation

In aviation selection there is one override to the above – if an occurrence was allocated priority 5 but the aircraft was fitted with a CVR, then the Commission should investigate to preserve the protection of the CVR data. Given where CVRs are fitted, a Priority 5 is unlikely



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Does our small size pose a challenge in the Selection process?

It can do. The structure of the Commission is such that there is a single Chief Investigator (for my sins – me!) We are not big enough to have some form of "team leadership" in each mode, although we do recognise seniorities. Therefore, whoever is Chief Investigator

Therefore, whoever is Chief Investigator inevitably is experienced in his/her specific mode but not in the other modes. Therefore even within the Commission, I have to take council and advice from the technical knowledge and experience around me.

Do we meet the Challenge?

I believe that we do. Our criteria work well for us. To err is human, and on occasion hindsight has told us that there were events that perhaps we should have investigated.

For those events that we do decide to investigate, we sometimes find that the circumstances were not as significant as first thought, but we have the mechanism to discontinue an investigation.







Other Challenges of being small?

The most obvious challenge to be expected will come if (or should that be when?) there is a major accident. Regardless in which mode that event occurs, the **Commission will be unable to cope on its** own, even with non-modal investigators filling some roles as appropriate. The **Commission would have to seek help from** other administrations and from the New Zealand Regulator. Our nearest help is here in ATSB, but we would probably need more than it could realistically supply, so we would have to look also to UK, Canada, USA etc. For a major event this would mean a significant and lengthy contribution from these organisations.

COMMISSION THE STIG NTION On a business as usual basis: Mostly we cope well enough. Recently the outstanding case load of rail investigations was 38, spread between three investigators. A lull in occurrences and a lot of hard work has reduced that to 16.

A very recent and still on going marine site investigation took one of my two marine investigators away for nearly two weeks. The first investigator was relieved by the second, leaving me with no practical marine cover for a while.

Investigation methodology

A single mode investigation agency has international and probably domestic requirements placed upon it with regard to investigation methods. Notably in aviation, ICAO have the requirements of Annex 13. Born out of aviation investigation, the Commission adopted Annex 13 as the benchmark for investigation and applies its principles to the two other modes.

In marine, there has been an IMO voluntary Code of Investigation, which has been in a state of change over several years, and generally followed by most States. There is a current push for IMO to make that Code, at least in part, mandatory. Not surprisingly it follows a similar format to Annex 13.

In rail, there is no internationally recognised standard or Code of Investigation



Therefore, with the application of Annex 13 and its counterpart IMO code, we have investigators in three modes all working to essentially the same investigation methodology and reporting standards.

There are however inevitable differences.

Notable among those is the role of the vehicle manufacturer. You will all know that in aviation with mass production and certification of aircraft types there is provision for, and generally forthcoming, generous assistance from aircraft manufacturers.





The same does not apply in marine and rail. While there may be "classes" of ships and boats, they are very limited in number and often with significant differences within a class. Also different owners of ships of a class are at liberty to choose which Classification Society that they use. That Classification might be in a country other than where the ship was built.

A good example in rail is a series of rail cars bought by NZ Rail that came with no plans or maintenance history and certification that was voided by virtue of the vehicles being exported.

Little, or no assistance comes to us from manufacturers



The essential difference – Also a Challenge

You will have gathered by now that the aviation, rail and marine industries are very different beasts – their commonality being the transport of people and goods from one place to another.

Inevitably, the people that populate those industries are also quite different.

With our investigators coming from the folds of their respective industries, I have a team, naturally of individuals, but also three groups showing some quite distinct traits.

An HR consultant who recently did some work for the Commission described our team of investigators to me as "interesting" – a term which she was reluctant to elaborate on!



We strive for investigation consistency in methodology, analysis and reporting. **Industry differences by way of regulatory** structure and oversight, safety management systems, operating procedures and practices, and safety cultures can make a safety argument put forward in analysis acceptable and practical in one mode, but the same argument may not necessarily be pertinent in another mode.

There has to be a constant awareness of what is reasonably acceptable behaviour in each mode, and that any suggested safety improvements are applicable and feasible in that mode.

One size does not fit all!

That said, the Commission reports across the modes are as consistent as they can be.

COMMISSION COMMISSION COMMISSION COMMISSION COMMISSION COMMISSION A good example of industry differences is what you would know as CRM. Some thirty years or more ago, the need for CRM and its obvious safety benefit was recognised. Opposition from operating staff was overcome and for many years, CRM has been second nature to flight crews.

It was only about ten years ago that the concept of CRM was introduced to marine and known as BRM. The "kicking and screaming" era is not yet over, but acceptance levels are improving, but there are difficulties with multi-national crews.

In Rail, many operators are introducing CRM, as RRM, to their staff. With a crew of one, the team becomes the driver and the controller. It is our experience that the concept is a hard nettle to grasp for many rail staff.

Training investigators

Talk of CRM is a good introduction to our training. CRM/BRM/RRM are among the courses that TAIC investigators attend in order that they are aware of industry practices.

CRM courses are readily available for aviation and usually

BRM courses are also readily available in Australia, and have been based on the SAS aviation system.

RRM courses apparently do not exist – can anybody help?





Training a group of multi modal investigators poses its own challenge. There are core training modules that are common to all which has some advantage The common training includes: **Basic investigation Human factors Organisational factors** Witness interviewing **Stress management Effective writing** Word processing Media relations This common training can allow inter-modal assistance between investigators particularly

on larger or major events.

On top of the core training, the investigators receive mode specific training.

The different transport industries continue to develop, but at different rates – compare aviation, with new and sophisticated aircraft types appearing continually, with the New Zealand rail scene with its outdated and historic rolling stock fleet.

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There is arguably a need for aviation investigators to be given more specific technical training than those in the other modes. Indeed that is the current case. The significant difference in training resource allocation can be a cause of friction.

Public and media expectation

Agencies investigating single modes come under public and media scrutiny as does the Commission. Public interest is however fed by the level of media coverage.

New Zealand media are no different to those anywhere else – they concentrate on the dramatic and spectacular.

As a result, aviation accidents, particularly those with fatalities, tend to get much greater coverage, with the interest lasting much longer. There are of course exceptions to that rule.

A heightened level of media interest, while it can exert its own pressure, is not a driver to initiate an investigation.

However, does that make any of these any less worthy of investigation:























An overriding challenge

Keeping the team cohesive, functioning and happy

We have had our times of friction between modes with perceptions that attention or resources are given preferences at times to one mode above the rest. Managing all three modes therefore makes this a particular challenge.



No one mode is any more important than another, but there will inevitably be times when attention is heaped on one , or indeed one of its investigators. This has been the case very recently with a high profile marine investigation capturing the time of both investigators and myself.

The key to maintaining our small group in good order is communication, cooperation and mutual involvement and understanding. We have group discussions involving all investigators, with each IIC running through each site investigation and the progress of the investigation to date.

At report peer review time, at least one investigator of a different mode is part of that review.



All investigators attend when reports are presented to the Commission, and are free to venture comment, suggestion and opinion.

For my part, I make every effort to spend time with each investigator, listen to their needs and worries and resolve issues early. A large amount of my time is spend on ensuring consistency in the investigation reports AND OF COURSE ------

WE ALL EAT THE SAME CHEESE!





Thank You