Australian Government
Australian Transport Safety Bureau

Chief Commissioner

Our reference:
Contact: Martin Dolan

21 September 2012

Senator Glenn Sterle
Chair
Legislation Committee
Standing Committee on Rural and Regional Affairs and Transport
PO Box 6100
Parliament House
CANBERRA ACT 2600

Dear Senator Sterle

Thank you for your letter of 6 September 2012 asking for information on the ATSB's approach to risk analysis. You wished to know the protocol, methodology or model underpinning the risk analysis we use to determine the significance of a safety issue. You also wished to know the empirical basis of our approach, including the decision theory on which it is based.

As a starting point, it may be helpful to describe some of the key components of our overall approach to safety investigation and analysis. We take safety to be the state in which the probability of harm to persons or of property damage is reduced to, and maintained at, a level which is as low as reasonably practicable. Both our investigations and our safety research work are directed to the identification of **safety factors:** events or conditions that increase safety risk (that is, if they occurred in the future, they would increase the likelihood of an occurrence, and/or the severity of the adverse consequences associated with an occurrence).

Some of the safety factors we identify are classified as **safety issues:** that is, they are assessed as having the potential to adversely affect the safety of future operations, and as being systemic and ongoing. When we identify a safety issue, we assess its risk level. The process of assessing risk level is in four parts: determining scenario, assessing likelihood, assessing consequence and applying the results.

For scenario, we assess first what is the worst possible scenario that would result from an identified safety issue. Then, having assessed that in the light of existing risk controls, we determine the worst credible scenario. That scenario is then assessed for its consequence (minimal, moderate, major or catastrophic) and its likelihood (very rare, rare, occasional or frequent). For each of the classes of consequence and likelihood, we have indicative standards to guide the assessment. Application of the severity and consequence assessment results informs a decision about the level associated with risk of the safety issue as:

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- Critical: associated with an intolerable level of risk, or
- Significant: associated with a risk level regarded as acceptable only if it is kept as low as reasonably practicable, or
- Minor: associated with a broadly acceptable level of risk.

Our approach to risk assessment of safety issues is based on the current international and Australian standard AS/NZS ISO 31000:2009 - *Risk management - Principles and guidelines* and associated material. That standard, however, is principally directed at proactive risk management by organisations, while the business of the ATSB as a safety investigation organisation focuses on understanding the potential significance of safety issues and assessing whether others might need to take action. For that reason, we have focused particularly on the risk analysis and evaluation components of the standard. We have also drawn on approaches and techniques used by major transport organisations.

The ATSB's risk analysis approach is not intended or required to be a complete analysis such as may be required for the purposes of a developing a safety case or as part of a formal cost-benefit analysis. It is intended to be a structured, objective and efficient approach to determining whether a safety issue has a risk level which appears to warrant corrective action or, in some cases, further ATSB investigation. Our analysis will often be qualitative rather than quantitative in nature and is based on the evidence available to us through investigation, reports of safety occurrences and our research and analysis.

To support our approach to determining risk level and the possible need for corrective action, we have documented our safety analysis methodology and process as part of our *Safety Investigation Quality System* (SIQS). SIQS is supported by structured safety analysis training for all our investigators and by elements of our supporting Safety Investigation Information Management System (SIIMS – our in-house information technology system).

At Budget Estimates in May 2012, I was asked for my views about the encroachment of non-aviation related infrastructure in the vicinity or aerodromes, and whether or not it elevated the risk arising from the occurrence of power-loss situations. I answered that, in accordance with the risk analysis that we undertake (which I have outlined in this letter), I did not see the associated safety issue as significant.

In terms of the methodology I have outlined, the most credible scenario arising from an interaction between partial engine failure and the development of non-aviation infrastructure would be a collision with a building resulting in injuries or fatalities to people on the ground.

In terms of our indicative standards, such a scenario would be assessed as having a moderate consequence. Our best evidence for likelihood is our database of aviation safety occurrences. During the last ten years, we have records showing two occasions where there have been minor injuries on the ground as a result of accidents in the vicinity of an aerodrome. We have no records of fatality or serious injury. This is in a context where there are about 14 accidents in the vicinity of aerodromes for each million departures, with no significant variation in trend. Based on this and the longer-term information in our database, we would assess the likelihood of on-ground injury or fatality as rare. A safety issue that is assessed as of moderate consequence and rare likelihood is generally given a risk rating of minor.

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I trust that this provides sufficient context for understanding my remarks.

Yours sincerely

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