



Transport Accident
Investigation
Commission

Watchlist

Substance use: regulatory environment for preventing performance impairment

What is the problem?

Judgement, decision-making, and reaction time can all be affected by the use of drugs or alcohol. The use of performance-impairing substances by persons performing safety critical tasks in a transport environment is a significant risk. The Ministry of Transport supports zero tolerance of operator impairment; however, industry arrangements are uneven across the sectors and more could be done to manage this risk.

What is the solution?

Regulators and operators need a comprehensive set of measures to prevent impairment by the use of alcohol or drugs of persons performing safety-critical tasks. As a minimum, the aviation, rail, and maritime sectors – including recreational boating – should have in place arrangements to:

- set maximum limits for alcohol
- prohibit people operating aircraft, vessels or rail vehicles if they are substance impaired
- require operators to implement drug and alcohol detection and deterrence regimes, including random testing
- prescribe post-occurrence testing requirements for drugs and alcohol.

The detrimental effects of drugs and alcohol on cognitive abilities are well documented. International research suggests the likelihood and severity of accidents increase if people responsible for performing safety-critical tasks use drugs or alcohol. In the New Zealand aviation, rail, and maritime accidents investigated by the Transport Accident Investigation Commission, the consumption of alcohol or use of other performance impairing substances recurs as a contributing factor or a potential impediment to survival. Since the Commission first placed this item on the Watchlist, some progress has been made in legislating for the regulator to undertake non-notified drug and alcohol testing of commercial maritime operators.

Background

The detrimental effects of drugs and alcohol on cognitive abilities have been described and documented by researchers in the transport sector. Australian Transport Safety Bureau research describes how alcohol “impairs almost all forms of cognitive function, such as information processing, decision-making, attention and reasoning” (Newman, 2004a, p.1).¹ Such impairment detrimentally affects the performance of any demanding task.

Cannabis can also adversely affect behaviour, cognitive function and psychomotor performance; “complex tasks ... are particularly sensitive to the performance-impairing effects of cannabis” (Newman, 2004b, p.1).² In the case of a pilot, for example, flying skills deteriorate, and the pilot makes an increasing number of errors. Pilots are often unaware of their reduced performance.

The risk of accidents increases if people responsible for performing tasks critical to the safe operation of aircraft, vessels or rail vehicles use drugs or alcohol. The Australian research states “many studies have shown a significant proportion of aircraft accidents associated with alcohol use” (Newman, 2004a, p.1); similarly, a US report states, “numerous studies have shown that alcohol use increases both the likelihood and severity of boating accidents” (Lawrence, Miller & Maxim, 2006, p.1).³

The consumption of alcohol, or use of other performance-impairing substances, features repeatedly in accidents investigated by the Commission. Since the beginning of 2004, we have investigated fifteen occurrences where persons performing safety-critical roles in the operation of aircraft, vessels, or rail vehicles have tested positive for performance-impairing substances (one of these occurrences involved prescription medicines).⁴ Forty-five people died in these accidents, including the eleven killed in the hot-air ballooning accident in Carterton, one of New Zealand’s worst aviation disasters.

The Commission has made several recommendations about setting maximum allowable limits for performance impairing substances for people in safety-critical roles (currently there are no such limits in legislation), including those in charge of recreational craft; and providing for testing of such levels. Limits should be appropriate to the mode, and adequately tested for; and they should reflect the goal of zero tolerance to impairment. These measures are in line with the alcohol and drug testing, including random testing, that is accepted practice in road transport, as well as in other modes in other jurisdictions.

For employers, an effective testing regime to reduce the risk from drug or alcohol impairment has three steps: pre-employment, post-incident, and random testing. These aspects of safety management must be clearly set down in the organisation’s policy *and* put into practice. In September 2017, the Commission made two recommendations to KiwiRail in relation to testing: one to review its post-incident drug and alcohol policy to ensure all personnel directly involved in an occurrence are asked to submit to testing; and the other to review its low-ratio random testing programme⁵. The company responded promptly to these recommendations.

As a result of our recommendations from the tragic hot-air ballooning accident in Carterton, the then Government planned new measures requiring commercial aviation and maritime operators to have drug and alcohol management plans. In addition, the aviation and maritime regulators (the Civil Aviation Authority and Maritime New Zealand) were to be

given the power to undertake non-notified alcohol and drug testing. This was to include random testing, good cause testing and post incident testing.

In December 2017, the current Government passed the Maritime Transport Amendment Act 2017, which gave the Director of Maritime New Zealand the power to undertake non-notified testing of safety-sensitive workers in commercial operations if the circumstances give the Director reasonable cause to believe that drugs or alcohol may be a relevant consideration. However, the Government excluded from the amendments the measures related to random testing. Maritime NZ advises it is working with the Ministry of Transport to progress a Maritime Rule enabling the Director to carry out drug and alcohol tests on safety-sensitive workers on commercial vessels. Subject to approval by the Minister, it is anticipated that the rule will come into force by mid-2022. No Government since the Commission issued its recommendations from the Carterton accident has proposed changes to the recreational boating sector.

In 2019, the Ministry of Transport consulted on a draft Civil Aviation Bill.⁶ The draft Bill includes provisions stating that commercial aviation operators involved in safety sensitive activities must develop drug and alcohol management plans, which include random testing of safety sensitive workers. The Director of Civil Aviation would also have a power to undertake non-notified drug and alcohol testing. The bill was introduced into Parliament in September 2021.⁶ Current Civil Aviation Rules and obligations, and the Health and Safety at Work Act already place requirements on operators related to reducing the likelihood of substance-induced performance impairment.

When investigating an accident or incident, the Commission cannot require survivors, including those in safety-critical roles, to be tested for performance-impairing substances. This makes it difficult to assess the contribution, if any, of performance-impairing substances to the occurrence. The power of the maritime regulator to undertake non-notified alcohol and drug testing in the commercial sector will go some way to providing a solution to this difficulty.

The Commission will continue to monitor the incidence of accidents featuring alcohol or drug impairment, and to seek a regulatory environment that supports a zero tolerance for impairment in safety critical transport roles.

References

- ¹ Newman, D. G. (2004a) *Alcohol and Human Performance from an Aviation Perspective: A Review*. Research report from the Australian Transport Safety Bureau.
http://www.atsb.gov.au/publications/2004/alcohol_and_human_performance.aspx
- ² Newman, D. G. (2004b) *Cannabis and its Effects on Pilot performance and Flight Safety: A Review*. Research report from the Australian Transport Safety Bureau.
http://www.atsb.gov.au/publications/2004/cannabis_pilot_performance.aspx
- ³ Lawrence, B. A. Miller, T. R., and Maxim (2006) *Recent Research on Recreational Boating Accidents and the Contribution of Boating Under the Influence: Summary of Results*. Report by the Pacific Institute for Research and Evaluation sponsored by the United States Coast Guard.
https://www.uscgboating.org/library/bui-study/BUI_Study_Final.pdf
- ⁴ Transport Accident Investigation Commission Report AO-2012-001: *Hot-air balloon collision with power lines and in-flight fire, near Carterton, 7 January 2012*
<http://www.taic.org.nz/inquiry/ao-2012-001>
Safety Recommendation 012/13
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<https://www.taic.org.nz/inquiry/mo-2019-202>
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<https://www.taic.org.nz/inquiry/mo-2018-205>
- Transport Accident Investigation Commission Report AO-2017-001: *Eurocopter AS350 BA, ZK-HKW, Collision with terrain, Port Hills, Christchurch, 14 February*
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- Transport Accident Investigation Commission Report RO-2015-103: *Track occupation irregularity, leading to near collision, Between Manunui and Taumarunui, 15 December 2015*
<http://www.taic.org.nz/inquiry/ro-2015-103>
- Transport Accident Investigation Commission Report RO-2015-101: *Pedestrian fatality, Morningside Drive pedestrian level crossing, West Auckland, 29 January 2015*
<http://www.taic.org.nz/inquiry/ro-2015-101>
- Transport Accident Investigation Commission Report RO-2014-103: *Passenger train collisions with Melling Station stop block, 15 April 2013 and 27 May 2014*
<http://www.taic.org.nz/inquiry/ro-2014-103>
- Transport Accident Investigation Commission Report RO-2012-104: *Train 723 overran limit of track warrant Parikawa, Main North line, 1 August 2012*
<http://www.taic.org.nz/inquiry/ro-2012-104>
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<http://www.taic.org.nz/inquiry/mo-2012-201>
- Transport Accident Investigation Commission Report RO-2011-103: *Track workers nearly struck by passenger train near Paekakariki, North Island Main Trunk, 25 August 2011*
<http://www.taic.org.nz/inquiry/ro-2011-103>
Safety Recommendation 007/13

Transport Accident Investigation Commission *Report AO-2010-009: Walter Fletcher FU24, ZK-EUF, loss of control on take-off and impact with terrain, Fox Glacier aerodrome, South Westland, 4 September 2010*
<http://www.taic.org.nz/inquiry/ao-2010-009>
(Superseded) Safety Recommendation 011/12

Transport Accident Investigation Commission *Report MO-2009-201: collision: private jet-boat/private watercraft, Kawarau River, Queenstown, 5 January 2009*
<http://www.taic.org.nz/inquiry/mo-2009-201>
(Superseded) Safety Recommendation 005/11

Transport Accident Investigation Commission *Report MO-2006-204: fishing vessel Kotuku, capsized, Foveaux Strait, 13 May 2006*
<http://www.taic.org.nz/inquiry/mo-2006-204>

Transport Accident Investigation Commission *Report AO-2005-003: Piper PA34-200T Seneca II, ZK-FMW, controlled flight into terrain, 8 km north-east of Taupo Aerodrome, 2 February 2005*
<http://www.taic.org.nz/inquiry/ao-2005-003>

Transport Accident Investigation Commission *Report MO-2004-212: fishing vessel Iron Maiden, foundered off Pandora Bank, Northland, 16 August 2004*
<http://www.taic.org.nz/inquiry/mo-2004-212>

⁵ Transport Accident Investigation Commission *Report RO-2016-102: Train 140 passed Signal 10R at 'Stop' Mission Bush Branch line, Paerata, 25 October 2016*
<http://taic.org.nz/inquiry/ro-2016-102>
Safety Recommendation 025/17

Transport Accident Investigation Commission *Report RO-2015-103: Track occupation irregularity, leading to near collision, Between Manunui and Taumarunui, 15 December 2015*
<http://taic.org.nz/inquiry/ro-2015-103>
Safety Recommendation 023/17

⁶ Information on the draft Civil Aviation Bill can be found on the Ministry of Transport's website:
<https://www.transport.govt.nz/area-of-interest/air-transport/civil-aviation/>
(COVID-19 delayed the introduction of this Bill until September 2021)

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Updated content: references to new inquiries; information on new measures and continuing policy work intended to help reduce the risk of drug and alcohol impairment.

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Updated content: references to newly released inquiries; reference to adequate testing of performance-impairing substances.

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Updated content: reference to newly released inquiry (RO-2015-103); description of the steps in an effective employment testing regime; references to recommendations to KiwiRail in relation to testing; and introduction of the Maritime Transport Amendment Act 2017.

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Te Kōmihana Tirotiro Aituā Waka

Transport Accident Investigation Commission

www.taic.org.nz

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future.