

CARBON MONOXIDE POISONING

It's not called the 'invisible killer' for nothing – we can all learn from a recent carbon monoxide incident.



Carbon monoxide (CO) is a toxic gas caused by incomplete combustion, and it can get into the cockpit from leaking exhausts or from combustion heaters.

Many light aircraft heaters use exhaust system heat, and even a small crack or defect in the exhaust system can result in carbon monoxide entering the cabin.

In just over four years, eight cases of CO detection and poisoning have been reported to the CAA.

In the example in the September/October 2018 issue of *Vector*, a Diamond DA 40's CO detector illuminated. The crew cross-checked it with the standby detector which hadn't discoloured. Both crew felt symptoms including light-headedness, and reduced cognition and coordination.

The crew declared a PAN-PAN and followed the Quick Reference Handbook: cabin heat turned off, air vents open, and emergency windows open. The indication continued to occur multiple times during the return. The aircraft landed safely.

The maintenance investigation discovered a hole in the scat ducting linking the exhaust shroud to the heater valve box. This was assessed as a possible cause of the CO exposure but could not be confirmed.

Detection

The risk of CO poisoning is increased because of its colourless, odourless, and tasteless qualities, which makes it very difficult to notice unless you have a detector installed.

Rule 91.509 *Minimum instruments and equipment* requires a CO detector to be installed if the aircraft is fitted with an exhaust manifold cabin heater or a combustion cabin heater.

Even if a detector isn't required, we strongly recommend fitting one, depending on your aircraft and its risk of exposure. They come in various forms from low cost panel-mounted chemical spot detectors (often under \$10) through to advanced electronic detectors which may have an alarm function.



// A view of a cockpit with a carbon monoxide spot detector fitted.

You need to actively monitor spot detectors for discolouration. They also expire so need to be replaced more frequently. It's good to check the expiry and spot colour when working through your preflight, engine run-ups, and during your flight.

Be mindful that CO detectors aren't necessarily foolproof, so be alert to any signs of possible exposure. The initial symptoms of CO poisoning can include headaches, nausea, and dizziness. More advanced effects can include blurred vision, impaired judgement, and drowsiness. These symptoms continue to increase in severity, leading to seizures, unconsciousness, and eventually, death.

What to do

If you detect CO, or your detector activates, there are some general steps you can take. The key message, however, is to land without delay.

- Try to isolate the source of the CO. If cabin heat is selected on, turn it off.
- Ventilate the cabin with as much fresh air as you can. If you have oxygen available, use it.
- Check yourself for symptoms.
- Advise ATC, and land as soon as possible.
- Seek medical attention, even if you feel better after landing.

The effects of CO can take considerable time to clear. While some breaths of fresh air might make you feel better, it can take longer for the effect of CO on your cognitive ability and motor skills to clear. So don't fly or drive after an occurrence.

Reporting

It's important to report any examples of CO poisoning to the CAA. Even if it's only suspected, reporting your experience can help inform analysis on CO trends with particular aircraft types or parts.

To report any occurrences, visit www.caa.govt.nz/report, email isi@caa.govt.nz, or call 0508 4 SAFETY.

More information

To read more on CO poisoning and detection, read our previous *Vector* articles:

- Carbon Monoxide Poisoning (March/April 2012)
- Carbon Monoxide (September/October 2004)
- CO in the Cockpit (March/April 2001) 

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We've created a new email notification list dedicated to cabin safety.

Make sure you subscribe to this to stay in the loop with updates to cabin safety content on the CAA website.

To subscribe, visit caa.govt.nz/subscribe. If you're already a subscriber, you can add the 'Cabin Safety' list to your existing subscription using the links at the bottom of the page.

You may be a pilot, engineer, operator, or other participant – but please pass this on to anyone you know who is involved in cabin safety and may benefit from receiving cabin safety information.



RADIOTELEPHONY CHANGES

It's all about the hundreds and thousands. There are some minor ICAO changes to radio phraseology that became applicable 8 November 2018.

Application	Example	Transmitted as	What's changed?
flight levels	FL 200	flight level two hundred	use hundred instead of zero zero
altimeter setting	1000	QNH one thousand	use thousand instead of zeros
transponder codes	2000	squawk two thousand	use thousand instead of zeros