Proposed NO2 standard unworkable for underground mines, tunnels - MinEx

Bernie Napp - Mon, 30 Jul 2018

WorkSafe's proposal to limit nitrogen dioxide exposure in underground mines to 0.2 parts per million will be impossible for industry to comply with, MinEx says.

The extractives industry national health and safety council's CEO, Wayne Scott, says technologies are advancing rapidly but do not extend yet to electric vehicles operating underground, or the removal of diesel from explosives.

Like New Zealand, Australia currently has a limit on NO2 underground of 3 ppm. The European Union will specify 0.5 ppm from 2023, in anticipation of expected underground, low-emissions technologies.

"There is not a lot of science to support a reduction from 3 ppm to 0.2 ppm," Scott says of WorkSafe's proposed changes to the Workplace Exposure Standards and Biological Exposure Indices (WES).

MinEx submitted against the proposed change on industry's behalf by the June 15 deadline, and made a further submission earlier this month, following concerns raised by industry.

Inside Resources understands the tunnelling sector is currently considering the issue, having realised it could be adversely affected by the proposal.

Workplace Exposure Standards

Updated last in November 2017, and amended in January, the WES are guidelines to implement the Health and Safety at Work (General Risk And Workplace Management) Regulations 2016.

The WES state: "Where hazardous or toxic substances exist in the same environment as workers, and the PCBU [person conducting a business or undertaking] is unable to successfully eliminate these substances from working environments, they are required to minimise and monitor worker exposure."

"The PCBU must also, so far as is reasonably practicable, ensure that the health of workers and the conditions at the workplace are monitored for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking."

At issue, says Scott, is what WorkSafe would do on inspecting an underground mine or tunnel if the new NO2 limit was found to be breached.

Further problems

Scott says current real-time instrumentation can only detect NOx with a tolerance of plus or minus 0.5 ppm, making it difficult to accurately measure to the extremely low threshold proposed.

NOx covers nitric oxide (NO) and nitrous oxide (N2O), for which the exposure standards are 25 ppm, as well as the acid-forming NO2.

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Organisation	OceanaGold
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Efforts to crack down on exposure to diesel particulates through "cleaner" engines may have had an unintended side-effect of greater emissions of finer particulates, and gases such as NOx, Scott says.

Craig Pledger, NZ territory manager for Orica Mining Services, says explosives are manufactured with "good oxygen balance", but their application is inevitably affected by ground conditions and geology.

"Reducing the NO2 limit is going to be quite restrictive, certainly in underground mines."

Drilling blast holes can create cracks in rock, for example, and explosive material can get into those cracks. During blasting, some of that does not always detonate, and may not detonate at full velocity.

"Even with everything being perfect, you are going to generate post-blast fumes," Pledger says. "Mine ventilation removes the blast fumes, so this time will need to be increased to meet the new lower limits."

MinEx's proposed solution

Scott argues WorkSafe should take account of overseas regulatory practice, and overseas developments with technology, before rushing to change the WES.

"Industry is taking a proactive and responsible approach through regular worker exposure monitoring and medical assessment.

"All underground mines operate with exposure measurements well below the current limit of 3 ppm, and there has been no evidence of health impact on underground workers from exposure to NOx."

OceanaGold

Waihi underground mine manager Charles Gawith says OceanaGold supports MinEx's work with industry bodies overseas to develop a workable solution.

"We place the highest priority on the health and safety of our workers and actively monitor global development in new technologies, such as lower emission diesel and battery-powered mining equipment, and adopt these technologies where practicable."

"The use of explosives underground is a contributing factor to the issue and we also continue to monitor technological developments in that area," Gawith says.