



Opinion of the Sectoral Social Dialogue Committee for the Extractive Industry on the Draft Recommendations of the Scientific Committee on Occupational Exposure Limits (SCOEL) for occupational exposure limits on the workplace for NO₂ and NO

In June 2013 the SCOEL has submitted draft recommendations for limit values for nitrogen dioxide (NO₂) at the level of 0.5 ppm and for nitrogen monoxide (NO) at the level of 2.0 ppm (8-hour averages). The affected stakeholders were invited by the relevant Directorate General Employment, Social Affairs and Inclusion (EMPL) of the European Commission to respond to the following three questions until 15th January 2014:

- 1) Are there any important or critical publications that have not been taken into account?
- 2) Were scientific data misinterpreted?
- 3) Is there any other relevant information?

In response to 1)

The SCOEL draft now has taken into account most of the essential, known studies. In contrast to the previous dominance of toxicological consideration transferring results of animal experiments to humans, now - corresponding to SCOEL Methodology Document (SCOEL - METH 2011) - both recommendations take into consideration the available epidemiological studies, especially the two studies conducted in the German potash and coal mining industry respectively. The study carried out for the coal industry (Morfeld (2010) et al. and Dahmann (2009) et al.) has even been recognised as the leading study. Concentrations on a higher level will be subject to further epidemiological studies which will be conducted in 2014 and 2015. These are respectively:

- a study launched by K+S Aktiengesellschaft on exposure of NO₂/NO, conducted by the Institute for Prevention and Occupational Medicine of the German Social Accident Insurance - Institute of the Ruhr-University Bochum (IPA), Prof. Thomas Brüning and Prof. Jürgen Bünger, in collaboration with the Institute for the Research on Hazardous Substances (IGF) of the Berufsgenossenschaft "Raw Materials and Chemical Industry", Dr. Dirk Dahmann. The study is expected to be launched in 2015; initial results with respect to the exposure measurements by the IGF can be expected in the first half of 2014.
- At the Institute of Occupational and Social Medicine, Aachen, University Hospital Aachen, Prof. Thomas Kraus, controlled exposure experiments on human subjects are being carried out with concentrations at levels of 0 to 1.5 ppm NO₂. The contracting body is the European Association for Research on Environment and Health in the Transport Sector e. V. (EUGT). The study will be completed in spring 2014.

- The study on the employees of Polish copper mines (analysis of the results of spirometry tests) will be conducted by the Wrocław Medical University (Department and Clinic of Internal and Occupational Diseases and Hypertension) based on research conducted by the Miedziove Centrum Zdrowia S;A. (the occupational medicine unit). It will examine the effects of the NO₂- and NO-concentrations on the health status of about 900 workers in the copper mining industry in Poland.
- Furthermore the United States Environment Agency (U.S. EPA) published a study in 2008 summarizing "Human clinical studies generally did not find direct effects of NO₂ on lung functionality in healthy adults at levels as high as 4.0 ppm."

We expect SCOEL to consider the results of the studies mentioned above when adopting final recommendations for indicative limit values at workplaces for NO₂ and NO.

In response to 2)

The derivation of the OEL recommendation of 0.5 ppm for NO₂ is crucially dependent on the uncertainties to be considered. SCOEL is correct in stating that the 13-week inhalation study (BASF b 2006) up to an exposure of 2.15 ppm NO₂ no exposure effects on the parameters of BALF or in terms of cell proliferation or apoptosis in the lung (SCOEL/SUM53 2013, p 10) were found. The results of these studies were not taken into account adequately. The comment of SCOEL that there were problems in the analytical measurement of NO₂ concentrations (SCOEL/SUM53 2013, p 12) is not understandable. The exposure levels measured are trustworthy and not "overestimated" (SCOEL/SUM53, 2013, p.12). The NOAEL of more than 2 ppm found in the BASF study (No Observed Adverse Effect Level) is therefore not considered sufficiently in the overall assessment/recommendation.

It should be emphasized that the study does not include higher exposures than 2.15 ppm, so that it is not clear what the NOAEL actually could be; a LOAEL (Lowest Observed Adverse Effect Level) could not be determined. The value of 2.15 ppm thus is an estimate of the NOAEL from below without being able to exactly determine it.

The derivation of a numerical value for a Short Term Exposure Limit (STEL/15 minutes-) - as specified by the SCOEL methodological document requires sufficient data to provide a scientifically based recommendation. This is not the case for NO₂.

In response to 3)

The recommended limit for NO₂ currently cannot be monitored reliably at the workplaces in **any** underground mining operation with the measuring techniques presently available and practically usable. There are currently no devices available for use in underground mines that could ensure a reliable, state-of-the-art mobile and **permanent monitoring** of occupational exposures at the level of the SCOEL recommendation for NO₂. SCOEL also admits that "in essence, with the presently available standard instrumentation the occupational exposure limit (OEL) of 0.5 ppm NO₂, as recommended here, may not be adequately controlled in underground coal mines." (SCOEL/SUM53, 2013, pp. 4).

Even though multiwarn instruments (electrochemical measuring cells) may be capable to measure NO₂ concentrations as low as 1 ppm reliably, when it comes to permanent measurements in underground mines in general, it is impossible to comply with the CEN standard EN 482 which defines specific requirements for compliance measurements related to the extended measurement uncertainty and the minimal value the instrument must be able to measure.

Therefore, WHEN SCOEL HAS PUBLISHED ITS RECOMMENDATIONS, the Commission and the tripartite advisory committee should specifically consider the practical risk management alternatives which are feasible in different types of industry where nitrogen dioxide occurs. Limit values shall be established or revised taking into account the availability of measurement techniques" (Directive 98/24 from 7 April 1998). Also a supervised transition period for the introduction of new OEL's might be considered.



The Sectoral Social Dialogue for the Extractive Industry (SSDEI) regards the recommendation of the Scientific Committee on Occupational Exposure Limits (SCOEL) of the occupational exposure limit for carbon monoxide (CO) at the workplace of 20 ppm (8-hour Time-Weighted Average) and a short-time value (STEL/15 min.) of 100 ppm as **scientifically unjustifiable** as well as **technically and economically not feasible**.

It confirms the opinion of the Safety and Health Commission for Mining and other Extractive Industries (SHCMOEI) from 5 October 1999 not to reduce the present CO-OEL:

“The SHCMOEI concludes that the proposed OEL for CO in the order of 20 ppm cannot be applied or implemented for the following reasons:

- The scientific evaluation as carried out by the SCOEL is not conclusive, there is no scientific evidence for the need to reduce the CO-OEL to the level proposed by SCOEL. It has to be stated that in 1975 and in 1981 the German MAK commission expressly defined that a MAK value even of 50 ppm prevents damage to health of healthy persons from exposure. This statement has never been seriously denied anywhere in the literature. The now present justification of SCOEL doesn't offer any further new information about a modified risk situation.
- Modification only relates to the fact that groups exposed to special risks (i.e. pregnant women and persons with cardiovascular diseases) are now to be protected by the reduced limit value.
- If SCOEL regards a limit value of 30 ppm as proven on the basis of risk studies not really applicable in mining, than it is absolutely incomprehensible that a reduction of the recommended limit value by a further third to 20ppm is demanded via a “preferred value approach” that requires – it seems – an additional safety surplus which is not based on further studies.

- In this context, the results of the regular examinations on German miners did not lead to any new findings concerning occupational health disorder.
- Technical and economical evaluations show that a 20 ppm value is not feasible. In the case of spontaneous combustion in a coal mine, the envisaged reduction of carbon monoxide values to 20 ppm (which has not been shown to be required for medical reasons) would result in the shut-down of production at an earlier stage with resulting economic effects.”
- For the other mining industry sectors CO is used as key component as measuring NO and NO₂ in the relevant measuring ranges contains high measuring inaccuracies. A reduction of the workplace threshold from 30 ppm to 20 ppm and continued use of CO as a key component would lead to operating areas with blasting operations being cleared for staff entry much later after blasting. This would reduce effective working time in the mines significantly and would have corresponding results on productivity and costs. Furthermore the planned reduction of the CO-OEL would lead to significantly increased ventilation requirements in the mines which would result directly in increased energy and operational costs. In most of the cases, a significant increase in ventilation is not feasible as the shafts with their given cross-sections and flow resistances represent the limiting factors and require by far the greatest portion of energy consumption in the ventilation underground.

“The SHCMOEI proposes deletion of reference to CO in Part 3 of the Annex to the draft proposal for a Commission Directive ... on indicative occupational limit values based on Article 3 of Council Directive 98/24/EC, and proposes including reference to an indicative occupational limit value for CO of 40 ppm in a new list to be adopted in future.”

Conclusion

With regard to a possible final proposal for defining a threshold for CO at the workplace, the SSDEI asks:

- to consider the special conditions in mining with regard to the employees;

- to include results of ongoing scientific investigations, like the study currently being conducted on the effects of NO, NO₂ and CO exposure on humans in the German potash mining industry;
- to take into account the missing technical and economic feasibility of the threshold proposal for European underground mining operations.

Based on the aforementioned arguments, the submitted proposal for the lowering of the occupational exposure limit value for CO is not acceptable for the SSDEI.

Bruxelles, 23th September 2014



To the attention of
The Working Party Chemicals of the
Advisory Committee for Safety and Health at Work

Subject : SCOEL Recommendations on Occupational exposure limits for NO and NO₂

Dear Sir/Madam,

The *Scientific Committee on Occupational Exposure Limits (SCOEL)* has adopted recommendations on occupational exposure limits (OEL) for nitrogen dioxide (NO₂) and nitrogen monoxide (NO) in June 2014: for NO₂ a value of 0.5 ppm (8-hour Time Weighted Average/TWA) and 1 ppm (15 min/Short Term Exposure Limit/STEL); for NO a value of 2 ppm (8-hour TWA). It is proposed to take over these values in the fourth list of occupational exposure limit values.

If the occupational exposure limits recommended by SCOEL were to be ultimately adopted at EU-level, then the current OEL values in a number of EU Member States would be disproportionately reduced with disputable scientific evidence and of the proof of measurability/compliance. The SSDEI has already adopted a common position, in which the weakness of the scientific basis and the measurability were analysed. Please find therefore enclosed the SSDEI opinion dated February 2014.

Due to the technical and economical unfeasibility of the proposals the competitiveness of the European Mining Industry will be seriously impacted. In respect of the technical and economical feasibility, a lot of measures have been already realized to improve the ventilation system, to reduce the NO and NO₂-emissions from the use of explosives and to improve the technics of the diesel powered engines. Additional technical measures to achieve the planned reduced OELs might not be sufficient to

guarantee the compliance with the currently proposed limit values for NO and NO₂. The very existence of the European underground mining industry might even be in danger.

With respect to the final decision on proposals for the indicative exposure limits for NO and NO₂ at workplace, the SSDEI calls for:

- recognition of the results of the studies conducted on the effects of NO and NO₂ exposure to humans at higher exposure levels. This concerns the results of the BASF-study and the ongoing studies from the European Association for Research on Environment and Health in the Transport Sector e. V. (EUGT) and from Institute of Prevention and Occupational Medicine of the German Social Accident Insurance – Institute of the Ruhr-University Bochum (IPA). (see SSDEI-positionpaper):
- consideration of the technical measurability and controllability of NO and NO₂ in underground mines in reality.

In contrast to the summary document concerning NO₂ dated June 2014 (SCOEL/SUM/53), there is no proof available that it is now possible to check compliance with the new recommended threshold limit value of 0.5 ppm by ambient measurement in the workplace. SCOEL stated that a new measurement technology („sensor“) with a lower detection limit of 0.04 ppm is available. This is not backed up by the scientific literature but instead by a particular company's technical specification (Dräger Safety AG). All available practical experience shows that even if the new sensors had the indicated sensitivity, calibration according to the state-of-the-art European Standard (CEN Norm EN 482) is impossible at this time.

Before adopting a new OEL for NO and NO₂ this problem should be solved.

- consideration of the practical risk management alternatives which are feasible in different types of industry where nitrogen dioxide occurs. Limit values shall be established or revised taking into account the availability of measurement techniques” (Directive 98/24 from 7 April 1998). Also a supervised transition period for the introduction of new OEL's might be considered.

- account to be taken of the technical and economic feasibility of the indicative limit value proposals in underground mining in Europe.

Consequently, the SSDEI demands and supports occupational health and safety regulations and occupational safety limits to be in line with the most recent and up-to-date scientific findings.

However, in terms of the foregoing arguments the SSDEI cannot accept the intended reduction of the indicative limit values for NO and NO₂ as it still is not based on sufficient scientific evidence, also in respect of possible loss of jobs in Europe.

Brussels, 23th September 2014