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CCSA Heath and Safety Working Group Meeting

Kate Jeffrey, Senior Policy Adviser, HSE

Thursday 18 September 2025

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Carbon Dioxide Toxicity Meeting, Monday 8 September 2025

Times (BST)	Name (Affiliation)	Description [Venue of speaker]
09:00 – 09:10	**Simon Gant** (Strategic Science Adviser for Net Zero, HSE)	Welcome and introduction [UK]
09:10 – 09:40	**Ian Indans** (Chemical Regulations Division, HSE)	Toxicology of carbon dioxide [UK]
09:40 – 10:10	**Ann Halford** (Risk Advisory, Energy Systems, DNV)	The effect of concentration fluctuations on the predicted toxic dose and the risk of fatality [UK]
10:10 – 10:30	BREAK	
10:30 – 11:00	**Wouter ter Burg** (National Institute for Public Health and the Environment, RIVM)	Deriving a probit function for carbon dioxide using the RIVM-methodology [Online]
11:00 – 11:30	**Chantal Smulders** (Global Head Product Safety Science and Regulatory Advocacy, Shell)	Analysis of recent human and animal CO_2 exposure studies [NL]
11:30 – 12:10	LUNCH	

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11:30 – 12:10	LUNCH	
12:10 – 12:40	**Bruno Reiners** (Dept. Environmental & Spatial Development, Flemish Government, Belgium)	Risk assessment for large-scale liquid CO_2 storage at a port facility [NL]
12:40 – 13:00	**Celin Russøy Tonheim** (Norwegian Directorate for Civil Protection, DSB)	Risk exposure from CO_2 facilities – Norwegian guidelines for calculation of risk contours and practical examples [Online]
13:00 – 14:00	DISCUSSION	Attendees are welcome to send suggestions of topics to discuss in advance to: simon.gant@hse.gov.uk

- The meeting was not recorded
- Slides are available on request: simon.gant@hse.gov.uk

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- HSE CO_2 SLOT/SLOD (and probit model derived from these thresholds) is widely used
  - UK, Netherlands, Norway, Belgium etc.
- Data supporting the CO_2 probit is complicated
  - Perhaps two different probit models should be used at high and low concentrations, but there is a lack of data to develop these two models
  - Animals respond to CO_2 in a very different way to humans: they can withstand much higher concentrations (>30% v/v)
  - Limited/no benefit to be gained in conducting further CO_2 exposure studies on animals/humans
- Possible future research could investigate PBPK models for CO_2 exposure?
- No current plans to revise CO_2 SLOT/SLOD thresholds or probit models in UK or NL
- Sources of information on toxicity:

HSE	https://www.hse.gov.uk/chemicals/haztox.htm https://www.hse.gov.uk/foi/internalops/hid_circs/technical_osd/spc_tech_osd_30/
RIVM	https://www.rivm.nl/bibliotheek/rapporten/2015-0102.pdf https://www.rivm.nl/sites/default/files/2022-06/20220608-carbon%20dioxide-INHOUDELIJK%20VASTGESTELD.pdf
IOGP	https://www.iogp.org/bookstore/wp-content/uploads/sites/2/woocommerce_uploads/2016/10/434-14.pdf

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Skylark CO_2 pipelines research project

- Invites to Skylark Modellers' Working Group emailed on Friday 12 September
- Aims: to evaluate the performance of dispersion models for simulating CO2 pipeline releases with collaborative modelling exercises on:
  - Behaviour of the CO_2 cloud near the source, i.e., the pipeline crater
  - Dispersion of CO_2 over simple terrain
  - Dispersion of CO_2 over complex terrain
- MWG members are not funded by the project – participation is voluntary
- Benefits to participation include:
  - The opportunity to evaluate and validate models
  - Participation in collaborative discussions with other MWG members
  - An opportunity to learn about the performance of alternative models, and to benchmark model predictions
  - Access to a subset of experimental data (NDA must be signed)
  - Involvement in joint publications, presenting the results of the modelling campaigns

Link to online registration form for Skylark MWG:
https://forms.office.com/Pages/ResponsePage.aspx?id=vlNZax1rgEmya1btiwvz3JxR6eYZAINHgV-VsuW4zI1UQzM5TTJGMlUyNDVETjE0NDFXUDdQTTJCSy4u

https://www.dnv.com/group/joint-industry-projects/skylark-pioneering-excellence-in-co2-pipeline-safety/

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Thank you

Any questions?

Kate.Jeffrey@hse.gov.uk

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