

Ad hoc Group of Experts on Coal Mine Methane

Eighth session

Geneva, 29 April 2013

Item 6 of the provisional agenda:

Update on the extra-budgetary project on methane capture and use: “Best Practice Guidance on Effective Methane Drainage and Use in Coal Mines”

UNECE COOPERATIVE PROJECT ON METHANE CAPTURE AND USE: BEST PRACTICE GUIDANCE FOR EFFECTIVE METHANE DRAINAGE AND USE IN COAL MINES

Progress Report

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| Project Title | Cooperative Project on Methane Capture and Use: Best Practice Guidance on Effective Methane Drainage and Use in Coal Mines |
| Countries | Kazakhstan, Ukraine and China |
| Duration | 12-18 months |
| National Implementing Agencies | Ministries, companies, organizations and institutions from energy, coal and industry sectors of the participating countries |
| Executing Agency | United Nations Economic Commission for Europe (UNECE) |
| Supporting Institutions | Global Methane Initiative of the United States Environmental Protection Agency (EPA) and UNECE |

Background

This project is an extension of and a follow-up to the “Extra-budgetary Project to Facilitate Financing of Coal Mine Methane (CMM) Projects in Central and Eastern Europe and Commonwealth of Independent States (CIS) countries” (2005-2008) and the “Cooperative Project on Methane Capture and Use: Best Practice Guidance on Effective Methane Drainage and Use in Coal Mines” that was launched at the fourth session of the Ad Hoc Group of Experts on Coal Mine Methane (AHGE on CMM) in October 2008 (ECE/ENERGY/GE.4/2008/2).

At its Third and Fourth sessions the AHGE on CMM agreed that the global coal mining industry lacked a set of recommended and accepted standards to guide mine operators, regulators, government officials, and technical professionals to manage their methane problems more effectively. This has especially been the case in the developing countries and the countries with economy in transition. To mitigate a part of the problem, the "Cooperative Project on Methane Capture and Use to Improve Mine Safety" was launched at the 4th session of the AHGE on CMM (October 2008). The organizations supporting the initiative – (UNECE and the Global Methane Initiative (then known as Methane to Market Partnership) – published “Best Practices Guidance on Effective Methane Drainage and Use in Coal Mines”. The publication detailed the benefits, objectives and principles of coal mine methane drainage and utilization in order to reduce fatalities and injuries of mine workers, protect mine property, reduce greenhouse gas emissions and efficiently utilize valuable energy resources.

Brief Description

Although the benefits of the *Best Practice Guidance* were self-evident, it was deemed that the value of the project would be further enhanced if the content of the document was exposed to an audience that would subsequently adopt the *Best Practices Guidance* as a part of the normal course of coal mining. Therefore the primary purpose of this project was to disseminate the *Best Practices Guidance* to a targeted audience through a series of regional workshops held at locations near to coal mines that frequently experience accidents caused by methane emissions into the coal mines. The workshop would feature globally recognized experts who would present topics taken directly from the *Best Practices Guidance*, and in a way that allows the audience to understand the technical, social and economic benefits of adopting these practices in their respective mining environment.

Among the countries facing challenges in methane management and coal mine safety, three countries were selected – China, Kazakhstan and Ukraine – to disseminate the *Best Practices Guidance*. To this end, three workshops were organized: in Beijing, China (October 2010), Karaganda, Kazakhstan (May 2011), and Donetsk, Ukraine (September 2011).

Below is a brief description of the three workshops. More details about them – including aims, programme, participants, key messages and other outcomes – can be found in the respective workshop reports available at <http://www.unece.org/energy/se/cmm.html>.

Results of the Project

1. Workshop in China

This was the first workshop aimed at promoting the *Best Practice Guidance*. The half-day workshop was held during the 10th International Symposium on CBM/CMM. It opened with a general overview of the *Best Practice Guidance*, presented by Mr. Pilcher, Chair of the AHGE on CMM. Mr. Zhen Xingzhou, Deputy Director General of the State Administration of Coal Mine Safety, made an introductory speech and performed the duties of moderator in guiding the exchanges between the experts and the coal mining sector representatives. Seven Chinese technical experts representing major coalfield areas in northern, central and western Provinces of China participated actively in roundtable discussions.

The workshop consisted of presentations made by Dr. Creedy and Dr. von Schoenfeldt, respectively, on “Best practice gas control” and “Analysis of the responses to questionnaires.” Mr. Richard Mattus of Megtec Systems was also invited to participate in responding to a query on ventilation air methane abatement and use technology.

The workshop ended with a lively roundtable discussion in which Chinese coal mine sector experts posed questions on drilling, outburst prevention, gas drainage and gas utilization to the international panel, and also stated their opinions. Mr. Zhen summarized the discussions and stated explicitly that China welcomes the guidance document as an important contribution to enhancing understanding and to improving mine safety. He recommended that it should be developed further and adapted by China to address the specific problems encountered in its coal mines.

One of the workshop's key messages was the importance of designing mine gas control systems to ensure that gas is captured and drained at concentrations with a factor of safety above the explosive range of 5-15% methane in air. Although China developed a method for utilizing gas mixtures within the explosive range, which incorporates a number of safety features to prevent the propagation of an explosion, the AHGE on CMM believes, since these precautions do not extend underground, that there is an unacceptably high underground explosion risk.

2. Workshop in Kazakhstan

The workshop was held as a whole-day event on 25 May 2011 at the premises of Technopark UniScienTech in Karaganda. This venue was technically well-equipped and provided good facilities. The workshop was attended by 42 participants. The majority of participants were representatives of

coal mines that are at risk or have experienced CMM accidents; mining institutions, governmental and regulatory bodies were also present.

International and national experts reviewed the key issues related to the *Best Practice Guidance*. The Ad Hoc Group of Experts was represented by Mr. Pilcher, Chair of the AHGE on CMM, Dr. Erwin Kuntz, technical expert and member of the *Best Practice Guidance*'s drafting group, DMT GbmH; William Tonks, Senior Project Manager and Neil Butler, Technical Director, both from HEL East Ltd. Branko Milicevic, Secretary of the Ad Hoc Group of Experts and the consultant Mr. Evgeny Alexeev also attended the workshop.

The practices in Kazakh mines were presented by: Dr. Segazy Baymukhametov from the Coal Division of ArcelorMittal Temirtau; Baurzhan Hamimolda, Director of Kazakh State Research Institute for Mine Safety; Svetlana Kabirova, Senior Geologist of ZhumysStroiService LLP; and Ertay Kulzhabayev, Deputy Director of Karaganda Technopark "UniScienTech".

Power point presentations were translated into Russian and shown on a second display. The workshop ended with a protracted interactive discussion in which the panel of international experts answered many questions posed by the audience and discussed the unique problems that exist at the Karaganda basin coalmines.

Some of the key points raised at the workshop relate to rather ineffective attempts to predict outburst, and are ineffective. The participants also recognized the current limitations in utilization of CMM (currently only around 5% to 10%), and they propose to introduce in 2011 a pilot scheme for power generation from CMM at one of the Karaganda Basin mine (Lenina).

3. Workshop in Ukraine

The third in a series of workshops was held on 22 September 2011 in Donetsk. It started around 11:00 a.m. and ended around 6:00 pm. It was held back-to-back with the "Technical Seminar on State-of-the-art Coal Mine Methane Capture and Use Technologies", organized by the US Environmental Protection Agency in collaboration with the US Department of Energy's Pacific Northwest National Laboratory and the Ukraine-based Agency for Rational Energy Use and Ecology (ARENA-ECO). The workshop was attended by 55 participants, mostly from Ukraine. Two participants came from Turkey. The number of participants, however, went down as the workshop progressed, mostly due to the fact that the workshop was held as the second and final part of a 2-day seminar on CMM, and a certain saturation with information was inevitable.

The Donetsk workshop highlighted the aspects of the *Best Practice Guidance* that are relevant to current mining practices and safety concern in Ukraine. The workshop illustrated principles-based approach to reducing explosion risk in coal mines and presented technical and others benefits of adopting *Best Practices Guidance* within the mining environment in Donbass.

Among other things, the workshop described a recent project in Ukraine on assistance for coalmine inspector training and Facility at Lugansk". Dr. David Creedy of Sindicatum Carbon Capital spoke about best practice explosion prevention. These two presentations on coal mine safety were particularly relevant and timely, in the light of the July 2011 disaster at Sukhodolsk-Vostochnaya coalmine near Lugansk that left 27 miners dead. The key message in Dr Creedy's presentation was that the risk assessment to minimising explosion risks should be combined with strong enforcement of safety regulations to prevent accidents. Dr. Kunz of DMT GmbH spoke about drainage of gas emissions induced by mining, concentrating on arrangement and sealing of the drainage boreholes, the use of pipes and pumps, and monitoring. Mr. Pilcher offered several practical examples of how advanced drilling technologies could be applied to drain over-pressured formations. He also described how accurate borehole placement was essential in complicated geologic and mining situations. Using directional drilling may help create a virtual circle: more safety from gas drainage → better coal production → new revenue stream from gas production → more investment in gas drainage → higher mine safety → greater mine revenues.

The workshop concluded that the problem of draining coal seams – pre- or post-mining – is generally complicated. It was also noted that additional best practice solutions should be sought: one of them

could be directional drilling. UNECE Group of Experts is available for consultation about feasibility of such projects, while Global Methane Initiative can provide additional resources. The workshop ended with a panel discussion on the ways to adopt *Best Practice Guidance* to improve mine safety in Ukraine and fight problems encountered in Ukraine coal mines. The panel consisted of seven international experts: Creedy, Kuntz, Mattus, Pilcher, Tonks, Triplet, and Schwoebel.

A practical, organizational lesson learned from this workshop was that any future *Best Practice Guidance* workshops should be standalone events to send a clear, unequivocal message that the mine safety is the primary focus.

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