

Ad Hoc Group of Experts on Coal Mine Methane

Eighth Session

Geneva, 29 April 2013

Item 8 of the provisional agenda:

Update on the extra-budgetary project:

“Coal Mine Safety and Life Support Systems”

Extra-Budgetary Project: Coal Mine Safety and Life Support Systems

I. Background

The project, funded by the Russian Federation and the United States, will be implemented within the scope of work of the UNECE Ad Hoc Group of Experts on Coal Mine Methane.

In its previous work, the Ad Hoc Group of Experts on CMM (AHGE on CMM) noted that the global coal mining industry lacked a set of recommended principles and standards to guide mine operators, regulators, government officials and technical professionals to more effectively manage methane. This was especially the case in emerging economies. To address this challenge, the "Cooperative Project on Methane Capture and Use to Improve Mine Safety", financed by the United States Environmental Protection Agency, was launched in October 2008. The project results were published in the "Best Practices Guidance on Effective Methane Drainage and Use in Coal Mines". The publication was followed by a series of workshops held in China, Kazakhstan and Ukraine as a first step toward disseminating information and encouraging adoption of best practices by opening dialog among world recognized experts and industry professionals within these countries. While this stage of the effort has been completed, some funds remain unspent.

Building upon the successes of this project obtained thus far, UNECE and the AHGE on CMM are now looking to maintain momentum by focusing on the coal mine safety through implementation of best practices that reduce explosion risks through management of methane and dust hazards. Promoting comprehensive recovery and use of methane will lower the risk of gas related accidents; but the AHGE on CMM recognizes that the use of life support systems is crucial to saving lives in the event of unpreventable accidents.

Coal-mining countries throughout the world have recently faced serious accidents which resulted in fatalities and huge economic and related social losses. Examples of some recent coal mine accidents are given in the table below, in a reverse chronological order.

<i>Date</i>	<i>Coalmine</i>	<i>Country</i>	<i>Cause of accident</i>	<i>Fatalities</i>
29 July 2011	Suhodolska	Ukraine	Methane explosion	26
8 May 2010	Raspadskaya	Russia	Methane explosion	90
5 April 2010	Upper Big Branch	United States	Methane explosion	29
19 November 2010	Pike River	New Zealand	Methane explosion	29
18 September 2009	Wujek-Slask	Poland	Methane explosion	20

According to some estimates, China accounts for over 80% of fatalities in underground coal mines. In 2006 alone, according to the Chinese State Work Safety Supervision Administration, 4,749 Chinese coal miners were killed in thousands of blasts, floods, and other accidents.

Although some explosions were caused by coal dust, most of the recent disasters were methane-related. The worst accidents were those that began as a gas ignition followed by an explosion of dust entrained in air. These accidents could have been prevented through more effective drainage and ventilation of coal mine methane coupled with dust control. Fatalities in these accidents could have been minimized or altogether avoided if the state-of-the-art life support systems were used.

In implementing the project UNECE would primarily harness the AHGE on CMM expertise, but would also count on support by others, such as, for example, the coal mine operators, the coal mine safety institutes, the Ministry of Energy, local administration, and the academia.

The project will start in early 2012 and will be finalized by 31 December 2013.

II. Objective

There are two principal objectives of this project:

1. To act preventively and avoid methane-related coal mine accidents through a better management of methane, coal dust and other hazards inherent to underground coal mining by implementation of best practices.
2. To minimize fatalities and other damage through a better use of life support systems.

These two, mutually-reinforcing objectives are to be accomplished through a systematic work at a reference coal mine. The objective of the project is two-fold:

1. Audit the safety practices at the reference coal mine and get to the root of safety challenges that place the mine at risk; and,
2. Improve the conditions at the mine by encouraging the implementation of best practices that will serve to ensure increased safety, lowered methane emissions, and higher productivity and profitability.

III. Expected accomplishments

EA 1 - Increase understanding of the safety challenges faced during operations at the reference coal mine. Getting deeper into the root causes of coal mine safety challenges at a single mine would offer an opportunity to demonstrate the importance of employing principles-based best practices including preventive measures such as the required legislation, technical safety measures, improved work attitude and culture, the use of methane detection technologies and modern life support systems.

EA 2 - Share findings acquired at the reference coal mine among coal mine safety professionals and other stakeholders from other coal mines within the mining region, and from other coal mining regions that face similar challenges.

EA3 - Share findings of the study and workshop proceedings using modern interactive information technology tools.

IV. Indicators of achievement

IA1 – The study on coal mine coal mine safety challenges faced at the reference coal mine is appropriate for the conditions, accurate, comprehensive, informative, and well-received by coal mine safety experts from the coal mining region and other coal mine safety and regulatory institutions and inspectorates. The list of life support systems recommended for the reference coal mine is found to be useful and endorsed by coal mine management.

IA 2 – The workshop(s) at which the study will be presented are well-attended and have provided a good forum for learning and exchange of experiences among the international and national experts.

IA 3 – The multimedia material reporting the results of the study, and other materials available from the "coal mine safety bookshelf" has been well received by the wider audience and has attracted a measureable attention and overall

positive feedback. Materials and information that report the results of the work and the resources available from the "coal mine safety bookshelf" are incorporated into third party publications and are used in presentations to mine managers in other countries.

V. Main activities

A.1.1. - Select the reference coal mine. The project will focus on a reference underground coal mine in the Russian Federation. A mine that is presently facing difficulties with high gas emissions and coal dust will be selected by the representatives of the Russian Federation's Ministry of Energy, with the help of the Ad Hoc Group of Experts on CMM.

A.1.2. - Visit to the reference mine by the international experts. The experts hired by UNECE will spend the needed time to determine how employing best practices in recovery and use of methane could alleviate some of the problems experienced at the coal mine. The primary aim of the work done by the experts would be to develop a program by which the reference coal mine could improve mine safety for the miners, primarily through a better methane management through using the appropriate mix of drainage and ventilation practices suited for the geological and mining conditions present at the mine.

A.1.3. - Focus on life support systems. In addition, the experts would determine what kinds of life support systems are available on international markets, and provide a list of appropriate life support systems that could be used in case of an accident. In particular, they would concentrate on:

1. personal protection equipment and gear
2. collective protection equipment (e.g., safe chambers)
3. accident prevention equipment and systems for life support (ventilation, drainage)
4. methods and means of hazard control
5. safety rules and principles-based regulations that ensure increased coal mine safety

A.1.4. – Draft and publish case study on coal mine safety and life support systems at the reference coal mine.

The results of the work done by the experts at the reference coal mine will be documented and published as a case study that might be applied to other similar mining situations. These results will establish a relationship between the Ad Hoc Group of Experts on CMM and the mine at which safety would be monitored over the ensuing years to gauge the impact of the work done by the group of experts.

A.2.1. - Organize workshop(s) to disseminate the case study. Although carried out locally at a single coal mine, this project will have a wider reach. Findings of the case study will be disseminated at one or two workshops organized at the coal mining regions (e.g., Kuzbass, Donbass, Karaganda) that face similar challenges as those encountered at the reference coal mine.

A.3.1. - Select and edit multimedia material on coal mine safety and life support systems. Some results of the case study will be available as a collection of multimedia material on coal mine safety. Such material would present findings in an easy-to-understand form, appropriate for and understood by a rather diverse targeted audience (policy-makers, regulators, legislators, coal mine operators, mine safety managers, local government officials, etc.). The material may involve informative podcasts of various lengths, with facts and findings related to past accidents and the measure taken to avoid them in the future.

A.3.2. - Create an "online coal safety bookshelf". The multimedia material would be subtitled as needed in Chinese, English, French, and Russian, to further increase its reach. It would then be placed on an "online coal safety bookshelf" hosted by UNECE, from where the stakeholders could access it. This bookshelf may be perceived as an embryo of a database on coal mine safety that could be subsequently developed.

VI. Budget

- a) The project budget for the whole implementation cycle 2011-2013 is \$140,000. If this, most would be financed from the \$90,000 grant by the Russian Federation. In addition, \$26,000 that remains from the Cooperative Project on Methane Capture and Use to Improve Mine Safety (grant by the US EPA) and \$24,000 that remained from a previous tranche of the Russian Federation-funded projects, would also be used.

- b) Support also will be solicited from ‘in-kind’ contributions from related UNECE intergovernmental bodies notably the Committee on Sustainable Energy and the Ad Hoc Group of Experts on CMM (by, e.g., providing expertise and time of experts for peer-review, or content for the multimedia material), and the interested UNECE governments and their organizations (such as, e.g., the United States Environmental Protection Agency or the US Mine Safety and Health Administration).
- c) The UNECE will provide an ‘in-kind’ contribution of project counterparts in staff time, documents preparation, translation and distribution, publications and conference services.

VII. Work plan and Activity-Based Budget

The project/activity work plan provides a timeframe for the activities to be carried out during the implementation cycle.

Expected accomplishment (EA)	Main activity	Timeframe by activity	
		2012	2013
EA 1 - Increase understanding of coal mine safety challenges faced at the reference coal mine	A.1.1. - Select the reference coal mine \$5,000	X	
	A.1.2. - Visit to the reference mine by the international experts \$20,000	X	
	A.1.3. - Focus: Life support systems \$20,000.	X	
	A.1.4. - Draft case study on coal mine safety and life support systems at the reference coal mine \$40,000		X
EA 2 - Share findings acquired at the reference coal mine among coal mine safety professionals	A.2.1. - Organize workshop(s) to disseminate the case study \$25,000		X
EA3 - Share findings of the study and workshop proceedings using modern interactive information technology tools	A.3.1. - Select and edit multimedia material on coal mine safety and life support systems \$15,000		X
	A.3.2. - Create an "online coal safety bookshelf" \$10,000		X