UKRAINE GRANT EVALUATION

GRANT NUMBER E-9-K-3-0057

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UKRAINE INTERVIEW TRIP
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SUBMITTED TO:

STEPHEN MARLER
UNITED STATES DEPARTMENT OF LABOR
INTERNATIONAL LABOR AFFAIRS BUREAU

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LIST OF ACRONYMS AND SPECIFIC WORDS

AMS	**ATMOSPHERIC MOMNITORING SYSTEM**
ATRS	**AUTOMATED TEMPORARY ROOF SUPPORT**
DOL	**DEPARTMENT OF LABOR – UNITED STATES**
Grant	**GRANT NUMBER E-9-K-3-0057 (IN MY COMMENTS)**
ILAB	**INTERNATIONAL LABOR AFFAIRS BUREAU**
LED	**LOCAL ECONOMIC DEVELOPMENT**
MSHA	**MINE SAFETY AND HEALTH ADMINISTRATION – UNITED STATES**
NIOSH	**NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH**
OTLA	**OFFICE OF TRADE AND LABOR AFFAIRS – UNITED STATES**
PEER	**PARTNERSHIP FOR ENERGY AND ENVIRONMENT REFORM**
PDT	**PERFORMANCE DATA TABLE**
PMP	**PROJECT MONITORING PLAN**
PPE	**PERSONAL PROTECTIVE EQUIPMENT**
State	**UKRAINE GOVERNMENT (IN MY COMMENTS)**
TOR	**TERMS OF REFERENCE**
UK	**UNIVERSITY OF KENTUCKY**
USDOL	**UNITED STATES DEPARTMENT OF LABOR**

Comment [SM1]: Should probably be GOU (Government of Ukraine)

Comment [SM2]: Should use either USDOL or DOL but not both.

INTRODUCTION TO EVALUATION

At the request of ~~Stephen Marler,~~the United States Department of Labor's Office of Trade and Labor Affairs (OTLA), I was contracted to do a final evaluation of three projects and an interim evaluation of one project covered by Grant Number E-9-K-3-0057 that was originally dated for the period of September 30, 2003 to September 29, 2005. This Grant was extended several times and is still active for one project; that being the Inspector Training initiative. The completed projects of the Grant for evaluation are the Ventilation project, Horizontal Drilling project, and the Roof Bolting project. Prior to this grant evaluation, a final evaluation was performed by Norwest Engineering on two other projects. Those projects were for the Rock Dusting project and the Water Filtration project. Additionally, two other projects are still being implemented on "Personal Protective Equipment" and "Accident Reporting, Recordkeeping, and Accident Analysis".

The following Terms of Reference (TOR) Grant Review is directly from the evaluation request to provide a consistent background for this evaluation ***All type in blue/bold/italicized is from the Terms of Reference.***

BACKGROUND

TERMS OF REFERENCE

Final Evaluation of Grant E-9-K-3-0057
Ukraine Coal Mine Safety Project

I. Project Background

With independence, Ukraine inherited an excessive number of coal mines, a bloated work force, antiquated equipment, and insufficient financial resources to correct problems. At the end of 2009, Ukraine had 165 mines in operation; 162 underground mines and 3 surface mines. All except twenty-five of the coal mines and related organizations are owned by the State and are heavily subsidized. With the lack of financial resources, the State is unable to replace antiquated, worn-out equipment that further contributes to the safety problems in the coal mines. During 2009, the Ukrainian coal industry produced 72.2 million raw tons of coal from the 165 mines. Ukraine has the second worst coal mine fatality incidence rate in the World, but it has been making progress. During 2009, 151 coal mine fatalities were recorded while producing 72.2 million raw tons, down from 267 fatalities while producing 81.86 million raw tons during 2002.

The reserves of shallower, thicker coal seams in Ukraine had been depleted. Coal is being mined at an average depth of 660 meters and the coal seam thickness is often less than one meter. In addition, the geological conditions of the coal mines are not favorable in that a large amount of methane gas is trapped in the coal seams and surrounding rock strata. Methane builds up in gob areas and sealed

mine workings. These conditions cause spontaneous outbursts, and as mining progresses, methane gas is released into the mine creating an explosive atmosphere. The gas that has built up also leaches into the mine from sealed gob areas and seal mine workings. The ignition of the released methane into the mine is the main contributor to Ukraine's high rate of coal mine accidents and fatalities.

Rock Dusting/Water Filtration

The U.S. Department of Labor (DOL) initiated a Coal Mine Safety project in May 2000 in response to the 11 March 2000 explosion at the Barakova Mine in eastern Ukraine. The devastation caused by this disaster claimed the lives of 81 coal miners. The initial source of the explosion was an ignition of welding gases, but the most intense and destructive forces were due to the ignition of coal dust.

At the direction of the White House, DOL offered its assistance to implement measures that could prevent a recurrence. An agreement between DOL ILAB and the Ukrainian Minister of Labor, executed in May 2000, formalized this cooperative relationship. The Ministry of Coal was also a partner in that they oversee the State owned coal mines. DOL contracted with Partnership for Energy and Environment Reform (PEER) to provide managerial, administrative and technical support for the Project. A team of Federal mine safety experts from MSHA was assigned the task of identifying alternative means by which U.S. technology could be effectively transferred to Ukraine, applied at the Ukrainian mines and thereby reduce the likelihood of future disasters similar to Barakova. While the Ukrainian mining industry had a high level of technical expertise, it did not apply some practices used in U.S. coal mines, which have been found to minimize the risks of coal dust explosions. An evaluation of the Rock Dusting program was conducted in 2003 (see Appendix A).

Ventilation

During a review of the Rock Dusting program in 2003, the MSHA Assistant Secretary indentified ventilation as a problem in Ukrainian coal mines. PEER won a Solicitation for Grant Application to conduct a demonstration program to improve coal mine ventilation. DOL provided $800,000 to implement the program. PEER retained the services of the University of Kentucky to help implement the program.

It was found that the mines were losing up to 30% of their ventilation air through internal leakages and up to 45% through external leakages. Up to 75% of the total amount of ventilation air is lost to internal and external leakages in some mines. The external leakages were primarily due to the fact that ventilation fans are located in the hoist houses. These are very large structures that cannot be sealed. Under Ukrainian law, ventilation fans must be located in the hoist houses.
There were many causes of internal leakages. The majority of the leakages come from the pack wall that seals off the gob area and the seals that are used to seal off old abandoned mine workings. Ventilation air is allowed to leak into the areas thus allowing methane gas to leach out into the ventilation air. This leaking of methane causes a safety hazard and also inhibits coal production. The leakage of

ventilation air also causes the mines to run their ventilation fans at maximum capacity causing large energy costs to the mines. Up to 49% of a mine's electricity consumption can come from the ventilation fans. Many coal mines were trying to degas the gob area and sealed of mine working by using cross measure bore holes. In many cases there are leakages of methane due to poor techniques used to seal the degassing pipe collars and joints.

Four demonstration mines were selected, two in each of the Donetsk and Lugansk Regions. The project demonstrated the effectiveness of: external leakage sealing techniques; internal leakage sealing techniques in secondary ventilation system; internal leakage sealing techniques in primary ventilation system; and the implementation of techniques to reduce resistances in the ventilation system.

Methane Reduction

In 2004, the State Department (State) provided DOL with $1,500,000 to expand the Ukraine Coal Mine Safety Program. The U.S. Embassy in Ukraine was very interested in the program tackling the root cause of the majority of accidents – methane. Although vertical drill is a more effective method of removing methane in advance of drill, such a program would have been too expensive to implement and is usually associated with projects that capture and sell methane on a commercial basis. Additionally, vertical well drilling programs are often most effective when they are deployed several years in advance of mining.

DOL and State, with PEER's input decided to implement a horizontal drilling program. The program was designed to demonstrate enhanced drilling techniques to extract methane via long horizontal holes. The program purchased a U.S. manufactured horizontal drill, shipped the drill to Ukraine, and trained a Ukrainian crew to maintain and operate the drill. At the completion of the program, the plan was to have the drill remain in Ukraine and have the trained drilling crew available to drill holes at other mines. One mine was selected as a demonstration mine. In 2005 an additional $1,410,000 was provided by State to expand the project to an additional mine.

Drilling was conducted at the Belozerskaya Mine in the Donetsk Region with the drilling of three holes. The first hole reached a depth of 705 meters and the second and third holes were drilled to a depth of 804 meters. When the longwall intercepted the holes, methane was released and captured until the panel was completely mined and the area was sealed.

Roof Control

State provided DOL with an additional $1,500,000 in 2004. Through consultations, it was decided that this money would be applied to roof control. Inadequate roof control was the second largest contributor to accidents that result in fatalities and injuries in Ukrainian coal mines. The lack of proper roof control also affects the ventilation system for mines that have longwalls mining on retreat. All parties agreed that the introduction and implementation of proper roof control could allow

for multi-entry systems that would benefit ventilation, safety, mining costs, and production.

This program was only attempted at two mines and ran into a host of problems. The Ministry of Coal did not show any interest in resolving these problems. Due to the Ministry of Coal's resistance and at the request of Labor Safety it was decided to explore the possibility of providing technical assistance in the control of outbursts that normally occur at the ribs of the mines. The University of Kentucky was directed to research the various systems that were developed by NIOSH and determine if any of these systems could be modified to fit Ukrainian geological conditions and then be used to predict outbursts in Ukrainian coal mines.

The University of Kentucky found seven simulation models that were developed by NIOSH in the U.S. that are often used to predict geological occurrences. To test the models for use in Ukraine we requested specific geological data at two Ukrainian mines that are prone to roof and rib control problems. After numerous meetings and telephone calls we still have not received the data due to Ukrainian regulations that state these are classified as "State secrets" and cannot be released to foreigners. Because of this problem the University of Kentucky conducted a seminar with the Labor Safety Institute experts in Kyiv to review the NIOSH developed systems. From the seminar two NIOSH programs were selected and were provided to the safety institute for evaluation. Labor Safety attempted to secure data and information from the mines so that the programs could be tested and they were also unsuccessful. The Ministry of Coal continued to be uncooperative and PEER even met with the State security organizations to try and resolve the issue. After consultations with Labor Safety it was decided to abandon this program segment.

Local Economic Development/Inspector Training

As a result of the Orange Revolution, State provided DOL with and additional $1,402,000 to expand the program. It was decided that a local economic development (LED) program targeted at unemployed miners and their families could be a high profile program for the United States in a region that is heavily pro-Russian. The government of Ukraine on July 26, 2005 announced that the Ministry of Coal had been charged with the responsibility of transforming the highly state- subsidized coal industry into a self-sustaining one. It was anticipated that as these changes in the industry occur, many uneconomical coal mines will be closed and there will be a large population of displaced workers and few employment opportunities in the region. This program would provide local economic development assistance to facilitate the creation of small businesses to provide equipment and material in support of the Coal Mine Safety Program.

A year after the program began, PEER determined that the market for safety equipment was dominated by a few companies and that mines were not interested in nor had the resources to purchase equipment from new sources. The Director of the State Committee of Health and Safety at Work requested a program to train their inspectors to employ US inspection techniques. PEER requested that the funds for the LED program be allocated towards an inspector training program. DOL and State agreed.

The objective of the program is to provide training to government mine inspector trainers based on American inspection techniques, theories and applications. The program evaluated the inspection program currently used in Ukraine, and evaluated the concepts and procedures that will best promote changes and adaptations to improve mine safety through inspection activities.

Criteria to enhance and further develop the current programs to incorporate American philosophies concerning safety inspections and enforcement procedures were developed. The project developed a training system, handbooks and manuals of instruction to incorporate specific American-based proven concepts into the mine safety inspection concept. Training is currently being conducted.

The intended result of the program is an inspector training program designed to:

- ***enforce the current regulations;***
- ***encourage the use of all inspection tools currently available;***
- ***ensure that inspectors are knowledgeable in the regulations and the enforcement procedures allowed by Ukrainian regulations;***
- ***evaluate other inspection and enforcement tools which could be easily adapted and implemented into the Ukrainian inspection culture;***
- ***have a trained set of inspectors to investigate coal mine accidents;***
- ***be systematic and standardized inspection training programs that will be used to train new inspectors and periodically retrain current inspectors.***

EVALUATION PROCESS

In order to complete the requested evaluation for the referenced Grant, I included the following steps:

1. Review of material received before the Ukraine trip
2. Conference call with Stephen Marler and PEER representatives
3. Interview trip to Ukraine
4. Clarification requests with PEER personnel

The interviews conducted were twofold since the mining methods utilized in the Ukraine are totally different than those utilized in the United States. A portion of each interview in the mining regions was devoted to questions regarding the Ukraine mining methods. This was especially important since there were no mine visits and only one mine operator interview, and that interview was with representatives from a privatized mine. The original evaluation process in the Terms of Reference was to interview a mine operator and a coal miner from a State operated mine. All of the projects covered by the Grant were conducted at State owned mines. The security requirements to conduct interviews with the State owned mine and miners would have taken additional time that was not available.

BRIEF COMMENT ON GRANT PROJECT SELECTIONS

Since the original intent of the Grant was to provide assistance in reducing the fatality rate in the underground coal mines of the Ukraine, especially from major incidents resulting from the hazards of methane gas and explosive particle size coal dust, the selected projects were well planned. The Roof Bolting project had problems in implementation, and those funds were wisely switched to more effective projects. Each project will be discussed in more detail later in this report.

In order to improve the safety from the hazards of methane and coal dust, the previous projects involved improving rock dust applications and improving water quality. Improved filtration of the mine water supply, which would plug the sprays and increase the explosive and health hazards of coal dust, were reduced. Many automated rock dust machines were provided to a large number of the mines to more effectively apply the rock dust.

The previous selection of these two projects provided a valuable demonstration of very effective safety benefits. In the water filtration project, even production and maintenance improvements were attained. These projects did not require changes to the Ukrainian mining methods, but only improvement to the existing systems. I believe that this set the tone of acceptance for the projects to follow.

Once these projects were underway, additional projects to improve the mine ventilation system and methane removal were initiated. These projects required minimal changes to the mining process, but demonstrated the improvements that can be undertaken to reduce the hazards of methane in the mine. The Ventilation project addressed external leakage, internal leakage, and the concerns of restricted airways. The Horizontal Drilling project demonstrated

an additional gob methane removal process that could augment the existing cross measure borehole degassing system.

The Roof Bolting project had several obstacles that were not anticipated because strata and ground control data were considered to be "State secrets," and were either not provided or not accurate. In this report, I will express my opinion with regard to why I believe the removal of this project was warranted.

Although the Inspector Training project is ongoing, I believe that this project has the greatest chance to improve mine safety because multiple entities are not required in order for the project to move forward to completion. Also, another project under a different grant is the assistance in the accident reporting process, which compliments the inspector training. Since the University of Kentucky (UK) is developing a reporting system where Labor Safety chose the reporting parameters, the system has been well accepted by Ukrainian personnel. This ongoing UK project compliments the Inspector Training project and will provide the data and direction for the enforcement agency to use where additional emphasis is needed.

Even though the Inspector Training project is mirrored after the United State's Mine Safety and Health Administration (MSHA) process, all phases are tailored to Ukrainian needs since the PEER personnel have extensive experience in the MSHA procedures. The Training Center for Labor Safety inspectors is being equipped and staffed similar to MSHA's Mine Inspectors Academy in Beckley, West Virginia. The acceptance and enthusiasm of this project by Labor Safety personnel, and feedback reported from inspectors who have received the initial training, is very encouraging.

PARTNERSHIP FOR ENERGY AND ENVIRONMENTAL REFORM (PEER)

Comment [SM3]: Could title this Project Management and incorperate some of the infomation in the answers to the specific questions.

Everyone I interviewed had very positive comments to make regarding PEER projects and personnel. The selection of PEER employees who have been involved in all projects has been well received, and they are considered by the Ukrainians to be very professional and knowledgeable partners. The fact that Jerry Triplett resides in the Ukraine, that full time Ukrainian staff personnel are involved, and long term relationships have been established, have greatly contributed to the success of the Grant projects.

The trust that the Department of Labor, the United States Embassy, and the Ukrainian Government, from the Ministry of Coal to all levels of Labor Safety, has allowed efficient implementation of Grant projects, with minor exceptions, such as the Roof Control project.

The success of the Department of Labor's projects through PEER implementation was immediately evident. Since only some of my interviews were done in a formal office setting, it was rewarding to see the United States flag and the Ukrainian flag displayed together at an office in each city, and even lapel pins showing both flags were being worn by Labor Safety personnel.

The strict control over Grant funds is obvious as several meetings between PEER and the Lugansk Labor Safety personnel at the Lugansk Training Center were ongoing while my interviews were being conducted in a separate office. I found it amusing that members of the Training Center staff were lobbying for more than the four laptops and two pencils that Jerry Triplett had authorized, and he relented by jokingly agreeing to provide four laptops and three pencils!

REVIEW OF TECHNICAL DATA ON UKRAINE MINING METHODS AND RELATED PARAMETERS

Since the vast majority of the coal reserves in the Ukraine that would facilitate mining methods utilized in the United States have been previously mined, there is almost no similarity in the mining methods. Since the explosive hazards with methane and coal dust are universal, the projects selected to be implemented through PEER bridged the barriers of such diverse mining methods. It was difficult to learn in advance the mining methods employed in the Ukraine; however, with the excellent quality of the Ventilation project report, discussions with knowledgeable PEER staff, and devoting a portion of the interviews to obtaining an adequate understanding of the methods, a sufficient understanding exists to properly evaluate and comment on the projects.

Limited material is available on the world-wide web, especially on single entry mining and advancing longwall mining methods. The requirement is that all coal height of one meter or more (and even lower in some circumstances) is considered an asset owned by all inhabitants of the Ukraine and must be mined unless approval is obtained from Labor Safety. That approval is difficult to obtain, as evidenced in some of the mine maps reviewed. Longwall mining has been completed in "pie shape" recovery methods that require a constant changing of the number of shields required. Even adding or removing one shield would result in a major mining disruption in the United States. There are no single entry mining sections in the United States, and any such method would require numerous Petitions for Modifications. Even in deep overburden cover, such as exists in the Western United States, two entry mining is accepted. Should greater mining depth or other geological concerns exist, large barriers are left between each longwall panel in order for two entries to be driven. Those specific mine areas required large coal barriers between longwall panels, which would be prohibited in the Ukraine because of the coal reserve that would be lost. At the current time, there is no advancing longwall mining section in the United States, the last one having ceased mining in the late 1970s.

Very few coal mines in the United States experience the spontaneous methane outbursts that are common in the Ukraine, but many Ukrainian officials have visited those U.S. mines with PEER personnel as part of the Grant relationships.

Another technical factor that is quite different between the two countries is the primary roof support system utilizing arches being a passive installation in the Ukraine versus a typical supplemental arch roof support system with a full primary roof bolting system utilized in the United States. If an arch system of primary roof support was allowed in the United States,

some means to avoid employee exposure to unsupported roof would be an absolute safety requirement.

The use of a bleeder system is required in the United States unless the coal seam is susceptible to spontaneous combustion and a bleederless mining system is advisable to lower the oxygen in the caved gob to prevent oxidation. All mines in the Ukraine and most of Europe utilize bleederless mining systems. Since limited, and sometimes ineffective, cross measure boreholes have been a mandated requirement in the Ukrainian mines, the Horizontal Drilling project and the Ventilation project were extremely appropriate in additional methane control. These projects, in sequence with the previous projects of improved rock dusting and water filtration to reduce explosive coal dust deposits, provide protection from a possible ignition of methane and follow a well planned effort for improvement.

The current Ukrainian longwall systems utilize a mixing chamber to direct higher methane concentrations away from the face and into the tailgate. That air is then diluted with the face air and appears to have no maximum inlet concentration of methane; rather, the mixed outlet maximum methane concentration is measured. This method is assisted with the cross measure boreholes, but could be significantly improved with horizontal and/or vertical drill holes.

Addressing spontaneous methane outbursts in the mining methods employed in the Ukraine would be best accomplished by forming relationships with other European countries mining in similar conditions.

Comment [SM4]: Recommendation?

EVALUATION OF THE FOUR SPECIFIC PROJECTS COVERED IN THE GRANT REVIEW

Comment [SM5]: Could call this Project Performance and incoperate some of the information in the answers to specific questions.

Comments on the evaluation process of the four specific projects are not reviewed in depth in this section since many questions are addressed in the Terms of Reference and are included in that section of this report. When breaking out each question in the TOR, the request was for approximately ninety questions to be answered.

No major concerns were noted in any of the projects, and the Ventilation and Horizontal reports properly summarize the activity addressed in each specific report. The Ventilation project report is a truly professional documentation. The comments below combine the review and added personal comments, so any conclusions made by the reader should take that into account. Again, with no mine visit to more thoroughly understand the mining conditions and methods, many of my comments might be different had mine visits occurred.

VENTILATION PROJECT

Findings

The work performed by the University of Kentucky is extremely professional and well documented. Having university staff onboard who were familiar with European deep cover mining methods was evident in the quality of the descriptions of the mining methods utilized

in the Ukraine. The UK staff evaluated practical solutions that could improve the ventilation systems without the need to also learn the Ukrainian mining methods. The final report adequately summarizes the project implementation and lessons learned. The follow-up summary that PEER provided further condenses the outcomes in less technical terms and less data summaries. After performing an indepth review of that project; only the impact and usefulness of the project's outcomes are summarized following the interview process.

Conclusions

Although the Ventilation project summary report is excellent for the tasks that were performed, some important mining facts are still unknown. This makes it difficult ~~for me~~ to fully understand all methane gas concerns in the selected mines. This and other projects include the assertion that methane is a concern in sealed areas and gobs adjacent to the current mining gob. It would have been useful to have a degassing installation plan with all of the connections and the total methane liberation from a gassy mine. It seems apparent that Labor Safety and the mine operators stress the methane content of the coal seam versus actual methane liberation and concentrations during mining. The concentrations of methane that enter the "mixing chamber" prior to the dilution by the longwall return air is not mentioned. This is not a deficiency in the report; but it does limit my ability to fully evaluate the project. ~~I~~ Aassuminge~~d~~ that, as the airway restrictions were being evaluated utilizing computer mine ventilation simulations, field notes would have included the methane concentrations at those locations.

The leakage at the fan and hoist structures should have been obvious to the mine operators. The Ventilation project improvements, which involved simple corrections for the leakage, competent ventilation simulations, fan curve and blade settings investigations, and possible power cost savings, should have been a cause for concern from all parties involved in the Ukrainian mining industry. With the number of mine engineers employed at each mine, it is difficult to understand why such ventilation concerns were present. It was rewarding to hear the mine operator state that the brattice and other wrappings had been replaced with metal because of the severe weather and temperature conditions that would render the wrappings ineffective. The fan housing pictures in the UK report indicated that smaller fan and hoist installations were involved in the Ventilation project when, in fact, many are very large installations.

It is difficult to fully understand the entry configurations in the main entries since line diagrams were utilized in the project's final report and I only had minutes to look at several examples of mine maps. Mine maps would have been of assistance in realizing the impact of discarded mine equipment left in those main airways, and whether that equipment had to be moved long distances or whether the equipment only had to be moved to crosscuts or non-essential airways.

The reduction in the methane concentrations in the advancing longwall return air courses, and increase of methane in the panel degassing system, demonstrated how simple, cost effective changes can provide significant methane control improvements.

Comment [SM6]: Finding?

Since many of the seams liberate large quantities of methane, and vertical degassing is not regularly employed, it would lead me to believe that significant quantities of methane would also be present in return airflows from sealed area leakage. Whether the seals were equipped

to connect to the degassing system, or to address methane pressure build-ups and/or changes in barometric pressure, is not known by this evaluator.

Comment [SM7]: Finding?

HORIZONTAL DRILLING PROJECT

This project was an excellent choice for improving the removal of methane from the immediate and active longwall mining panel. With a variety of barriers to address before implementing the normally more effective vertical degassing drillholes, this method is adaptable to all of the retreating longwalls. With the future potential of directional drilling in the horizontal plane from the surface, or horizontal drilling from other main entries underground in the same seam, applications to advancing longwall mining may exist. One main advantage of in-mine horizontal drilling is that the current infrastructure of the existing degassing system can be used. The piping currently being utilized in the cross measure boreholes might be reduced or replaced, and could alleviate the major concern of the piping cost with the horizontal drilling project.

Comment [SM8]: Findings

Comment [SM9]: Recommendation?

The written report indicates that the future horizontal drillholes would be located at a greater height above the seam, which may capture a higher concentration of methane in the anticipated caved gob. Also in Table 1 of the Power Point presentation, comments on past drilling experiences in countries employing cross measure boreholes state that horizontal degassing provided significant improvement over typical cross measure boreholes and could even reduce or eliminate the need for cross measure boreholes. The improvement in Table 1 ranged from five times as effective in one case to being as effective as thirty cross measure boreholes in another case.

It has been stated that this initial project, coupled with evaluations of other countries' degassing methods, is being investigated to utilize the gas for energy production. During the United States visit by Labor Safety personnel, a degassing system utilizing the methane at the surface versus being vented to the atmosphere or flared was observed. From the mine maps that I had an opportunity to review, I surmised that most gateroads are in a fairly flat orientation to accommodate track equipment and the gobs wouldn't be expected to be steeply pitching from inby to outby orientation, but would be more in a headgate to tailgate orientation and vice-versa. This would indicate that the location of horizontal boreholes and/or limited vertical boreholes would be effective in removing additional methane from the gob. In the United States, where vertical boreholes are utilized, the frequency and spacing may mandate numerous installations. If the current cross measure boreholes have been acceptable in the past, then the addition of either horizontal or vertical boleholes would be expected to perform very well in the removal of methane.

There are two very important mining methods in the United States that require multiple vertical degassing boreholes. The first is the steeply pitching gateroad configuration, which is possible in the United States because of diesel support versus track support equipment, and the second is mining without bleeder systems. In the United States, where the gob is intentionally ventilated, additional vertical drillholes may be required when methane concentrations change as mining is conducted, to assure that any specific borehole does not

go below the upper explosive level for methane. In steeply pitching seams, the top of the caved gob may be at a lower elevation than the outby coal seam before caving.

I question how the total methane liberation is being addressed with only the current limited ventilation system and the cross measure boreholes that are coupled to the mine degassing system. Realizing that coal production rates are very limited, the methane remaining or being produced in the caved gob would have to be minimal when compared to several gassy, often steeply pitching mines in the United States. A few gassy, bleederless United State mines require very extensive mine degassing systems and multiple vertical degassing boreholes to address the methane liberation. The mixing chamber, as described to me, appears to be very close to the working face. In approved bleederless mines with which I am familiar, this potential of methane in large concentrations being that close to the face would need to be addressed with a nitrogen injection to reduce the concern of an explosive mixture near the active working face area. Again, these observations are limited because I was not able to enter an actual mine.

Combining additional methane control practices (brattice recommendations from Ventilation project with the Horizontal Drilling project) might produce even more positive results; however, the Ventilation project was performed in advancing longwall situations and the Horizontal Drilling was performed in a retreating longwall situation.

Comment [SM10]: Conclusion?

In reviewing the Horizontal Drilling project data, I found that significant methane recovery was occurring, especially since a less gassy mine was the site of the project. I am familiar with the horizontal drilling project in the Willow Creek mine in Utah that is included in Table 1 of the Power Point presentation. That mine also had an extensive vertical degassing system in operation, extremely large quantities of panel ventilation air, and an operational bleeder system, so the methane concentrations from the horizontal drilling would be expected to be much lower than if only a horizontal drilling system been in place. In analyzing this information, it would be conceivable that the next Ukrainian mine horizontal drilling in a gassier seam would be equal to or greater than the results of the Willow Creek mine drilling project, as listed in Table 1.

Comment [SM11]: Conclusion?

ROOF BOLTING PROJECT

Findings

Without more information on the original plans to test multiple entries utilizing roof bolting for retreating longwalls and/or main entries, my comments and evaluation can only be made with the information that was gathered from the interviews and pertinent mining systems depicted in the Ventilation project summary. The fatality statistics for 2009 and 2010 requested in Donetsk and provided to me in Kiev by Labor Safety confirm that 24.8% of fatalities in 2009 and 23.9% of fatalities in 2010 were the result of caving or roof falls. In addition to direct roof related fatalities, heart attacks are considered a work related reported fatality and were reported at 19% in 2009 and 26.5% in 2010. Due to the strenuous nature of the arch installation and related packwall activities, many of those fatalities could reasonably have occurred as a result of this arduous activity.

The Ventilation project report depicts several schematics of longwall mining; however, the indications are that all gateroad entries are arched, which is consistent with interview

responses from questions poised to PEER personnel. Without specific data relating mining methods to the depth of overburden, it is difficult to determine at what mining depths the roof bolting project was planned. In the United States, deep cover is addressed with two-entry mining gateroads with adjacent gobs; however, as the cover approaches 3,000 feet (915 meters), isolated panels are being utilized with a large barrier between panels. This method would probably not meet the requirement to maximize the mining of all of the coal reserves in the Ukraine.

Roof bolting is being performed at other European mines in order to allow greater spacing of the arches. European methods are being evaluating at the present time and would appear to be a more effective approach to the Ukrainian roof support system than attempting to implement procedures used in the United States. As stated elsewhere in this evaluation, the installation of roof bolts would be considered primary support in the United States and would include rigorous additional safety precautions. The method that would be tested in the Ukraine might involve hand drills at times, since mechanized equipment may have to be tailored for the Ukrainian mining system.

Conclustions

The cost of implementing a full roof bolting system for any significant distance might exceed the money allocated for the project. Whether the type of strata would require full roof and/or rib meshing is not known. Since the original project had the approval of all parties involved, those questions should have been addressed.

Comment [SM12]: Conclusion?

The decision to discontinue the Roof Bolting project appears to be a wise decision. Any changes to the roof support system should be left to Labor Safety and the Ukrainian mine operators, as any changes from the outside would require significant investment in equipment and constant on-site management. The way the project was changed from roof bolting and spontaneous outburst protection to a seminar of NIOSH prediction computer models was very effective and presented the Ukrainian mining industry with very valuable information.

INSPECTOR TRAINING PROJECT

Findings

The original intent of this project was to retrain displaced miners as uneconomical mines were closed. A Local Economic Development (LED) program would result in local manufacturing of the required updated mining equipment, resulting in the hiring of these displaced workers. This is described in the Terms of Reference, and since that program was discontinued for lack of interest, that Grant was switched to a Labor Safety request to train mine inspectors, utilizing a method used in the United States. This evaluation is only concentrating on the Inspector Training project, versus the original intent to establish a LED.

It is important to note that the programs of the United States MSHA system have been tailored to meet the needs and requirements of the Labor Safety organization. All PEER personnel are well versed in the MSHA systems, so tailoring them to the Ukrainian needs was not a major obstacle, even though the overall project was complex. Since PEER is also implementing the Accident Reporting, Analyses, and Recordkeeping project that has been sub-contracted to the University of Kentucky, both projects compliment each other.

The gathering of information needed to move this project forward started in June of 2008 and continued through August of 2010. This process necessitated a visit to the United States by Ukrainian Labor Safety officials and involved tours of the MSHA Academy, an MSHA District Office, an MSHA Field Office, and a mine operation. Eight hundred people attended the training sessions in the Ukraine, which is a good example of the acceptance of this project. Similar positive comments on the project were received at all of the interviews, and everyone was optimistic about the impact that this program will have on reducing injuries and fatalities in the mining industry. Additional comments received in Kiev hinted that the responsible agencies and personnel overseeing the other industries in the Ukraine will be closely monitoring this project for possible positive steps that could be implemented in those industries.

Conclusions

The training sessions resulted in allowing individual mine inspectors to feel comfortable asking questions, rather than merely listening and providing little input, as is their custom. The PEER personnel recognized that the attendees appeared to want to ask questions, but were unsure if it would be correct to do so. After the ice was broken, the attendees asked numerous questions and the enthusiasm for this project began in earnest.

More recent efforts are directed toward development of the Inspectors Training Center in Lugansk, which involves classroom facilities and computer training equipment. The excitement and enthusiasm for moving this project forward was very noticeable in both Labor Safety and PEER staff.

Comment [SM13]: Findins?

Capital investment available for a project of this type is minimal when compared to projects involving expensive mining equipment (i.e. rock dust machine), or material that is expendable (i.e. brattice cloth or drill pipe). The computer equipment can be utilized for other projects, rather than waiting for a future site selection, such as where to do the next horizontal drilling.

As I mentioned before, the two countries' flags displayed in most offices visited were a non-verbal indication of how successful this project has become.

Evaluation Scope – From Terms of Reference

The scope of the evaluation includes a review and assessment of all activities carried out under the USDOL Cooperative Agreement number E-9-K-3-0057 with PEER.

RESPONSE

A review and assessment of all activities carried out under the Grant was completed through interviews, together with a review of project summaries provided by PEER and the USDOL.

All activities that have been implemented from project launch to evaluation fieldwork should be considered.

RESPONSE

All requested activities have been reviewed, utilizing both the information provided and the interview process.

The evaluation should assess the achievements of the project in reaching its targets and objectives as outlined in the cooperative agreement and project document.

RESPONSE

This evaluation did assess the question of whether the project reached the intended audiences; however, as stated elsewhere, assumptions had to be made as to the target audience of the State mine operators and mine employees, since neither were directly interviewed and no mine visits occurred.

The evaluation of this project will:

1. ***Evaluate the validity of the project strategy, objectives and assumptions.***

RESPONSE

The three projects that were implemented, Ventilation, Horizontal Drilling, and Inspector Training, were planned very effectively. As discussed elsewhere, shifting the Roof Bolting project funding to other projects was a wise decision. Although it has been frustrating that the horizontal drill has been idle for several years, the value of that project has resulted in many discussions, mine visits to other countries, investigations, and actual utilization of methane gas removal with vertical and horizontal drilling. Since some of that effort has been at privatized mines, the overall goal of the Grant to reduce the fatality rate and improve mine safety in the Ukraine is being met. All of the projects are good steps toward that end.

Comment [SM14]: Could put this section as an annex.

Comment [SM15]: Could be conclusion in Horizontal drilling section

Comment [SM16]: Could be put in an general conlusions section

2. ***Examine the factors contributing to the challenges of the government, mine inspectors, mine operators, and miners to improve safety conditions.***

RESPONSE

Since all of the projects are implemented at State owned mines, numerous barriers present a challenge. All entities in the State owned coal mining industry are State employees (inspection, ownership, management, and workforce), resulting in several challenges to implementing change. The money necessary to improve mine safety appears to be secondary to money needed to improve production. Since production has a significant impact on the workers' pay and management performance, improvement expenditures in excess of the current regulatory minimum are frequently not approved by the State or the "cash intermediaries". A change in attitude in this area would require significant time and effort.

Comment [SM17]: Could be a finding in Project Implmentation and Management Section

Comment [SM18]: Could be a conclusion in Project Implmentation and Management Section

3. ***Evaluate the benefit to or impact on the target population (detailed in PMP).***

Comment [SM19]: This information could be uesed in the Project Implmentation and Management Section

RESPONSE

The Performance Data Tables (PDT) for three of the projects (Roof Control, Ventilation, and Horizontal Drilling) were provided, and the training summary for the Inspector Training project provides an adequate intended target audience.

Because of the delays in identifying and performing additional horizontal drilling in a gassy mine, the target population has not yet been determined.

Since the Roof Control project was revised to provide a seminar depicting several NIOSH computer simulation programs for ground control, it is apparent that a new target audience was reached

The Ventilation project was completed in 2007 and the interview responses indicate that information was dispersed to all State owned mines and possibly to all of the privatized mines in the Ukraine as well.

4. ***Evaluate the effectiveness and efficiency of project implementation to date in terms of activities completed, materials developed and used, equipment provided appropriate and used, work plan and budget execution.***

Comment [SM20]: Same here

RESPONSE

The ventilation recommendations by the University of Kentucky were simple, straightforward, and adaptable to the Ukrainian mines. The experience of the UK staff was vital in the effort to adapt European mining methods to the Ukrainian mines. The low cost steps to improve gob methane control from the Ventilation project would compliment the future use of horizontal and/or vertical drilling projects. The goals of both projects are to lower the methane gas concentrations in active airways and direct a larger portion of the methane liberation to the mine de-gassing system.

The Inspector Training program is still in progress, and significant training has been completed. With the Inspector Training Center moving forward at a rapid pace, this project meets these goals.

5. ***Assess the demonstration effect of the projects results in the following areas:***

   a. ***Were the project results widely disseminated?***

Comment [SM21]: Same here.

RESPONSE

The use of press releases keep most entities updated on the PEER projects. Without the opportunity to actually visit a mine and converse with the mine operator and miners, I am relying on what was discussed in the interviews. The management personnel from a privatized mine were well aware of all of the projects and were still implementing most of the project recommendations.

   b. ***Are the project stakeholders (Government, inspectors, mine operators, miners) aware of the project results?***

Comment [SM22]: Same here.

RESPONSE

No miners were interviewed. However, all of the other people I interviewed, including a press secretary, were well aware of the projects, which led me to believe that information was being widely disseminated. The Inspector Training project had a large audience, including people other than the inspectors with the Labor Safety staff. One press secretary stated that this was approximately the fiftieth press release that was compiled on the PEER projects.

   c. ***Did the project results cause any changes in inspection procedures, mine operations, regulations, laws, etc?***

Comment [SM23]: Same here.

RESPONSE

Some operations continue to utilize the equipment and concepts that were initiated through the projects. Additional methods of methane removal are underway at several of these mines. The Inspector Training project has been well received and the rotation of the inspectors to different mines is already underway. Reorganization of the Labor Safety personnel to more closely resemble the MSHA organization has also been initiated.

6. ***Assess the project management performance, including all staff.***

Comment [SM24]: same here

RESPONSE

There are several other grant projects addressing personal protective equipment, accident reporting and record keeping, being implemented at the same time as this grant, and the

projects appear to be well coordinated. During the interview process, I was told that the PEER staff is well qualified and dedicated to the success of each project.

7. ***Assess the effectiveness of the project monitoring plan on the basis of quality, timeliness, and costs.***

Comment [SM25]: Same here.

RESPONSE

The Performance Data Tables indicate adequate timeliness of the projects, other than the horizontal drilling project. The quality of the projects can be determined by the individual summary reports for the Ventilation and Horizontal Drilling projects. Both of these reports included an excellent technical summary of the projects.

The quality of the Inspector Training project indicates that efforts to date are of a very high quality and are proceeding rapidly.

Financial data was not provided to evaluate the cost effectiveness of each project; however, it did not appear that any of these projects exceeded their original budgets.

8. ***Document lessons learned.***

Comment [SM26]: Should be its own section.

RESPONSE

Projects, such as the Inspector Training project, which limit the number of agencies or participants, appear to have the greatest effectiveness. The close working relationship between Labor Safety and PEER personnel has been well received, with the program showing significant positive impact on mine safety. Projects involving underground equipment, such as the Horizontal Drilling project, require numerous entities to be on board with the overall goals. Since projects like this require safety improvement steps, which go above and beyond the current government regulations, acceptance can be stalled because of financial issues. Management commitment can vary due to a lack of enthusiasm for change. I believe the projects should still be funded, but everyone must have more realistic expectations regarding widespread acceptance of these and future projects. All of the in-mine projects have set precedence for the future acceptance of newer projects.

SPECIFIC EVALUATION QUESTIONS FROM TERMS OF REFERENCE

Validity of the project strategy, objectives and assumptions:

Comment [SM27]: Could be in its own section called Project Design and Strategy. However, most of the information presented are conclusions, would need more for findings.

1. ***Were the objectives and associated indicators realistic given the project timeframe, budgetary resources, and interventions proposed?***

RESPONSE

Yes, the objectives and associated indicators were realistic, especially since the goal of the projects is to improve mine safety and assist in lowering the underground fatality rate. The money budgeted for each project allowed for an initial demonstration of each concept. The Horizontal Drilling project should be considered complete when a successful drilling effort is performed in a very gassy mine. Comments received in the interviews indicated that a major concern is the final ownership of the equipment following the next drilling effort. I recommend that, after the final drilling is completed, ownership of the drilling equipment should be at the discretion of the Labor Safety staff.

2. ***Were the original critical assumptions valid?***

RESPONSE

The original critical assumptions were valid for all projects. However, because of difficulty in changing the ongoing requirement of arch support in single entry mining methods the barriers may prove to be too burdensome to overcome. This is the only project that presented a risk and it was a wise decision to discontinue. The USDOL halted this project because they did not receive the needed cooperation from the Ukrainian Ministry of Coal.

3. ***Are changes to the project strategy recommended at this point?***

RESPONSE

Because of the work on the Inspector Training project that has already been completed, coupled with the ongoing work on the Accident Reporting and Recordkeeping project, I do not believe any change in the project strategy is required. There is noticeable enthusiasm with regard to these projects, especially because they are tailored to the needs of Labor Safety. This project will be very effective in assisting a competent enforcement agency to enforce regulations, investigate accidents, and determine root causes for prevention of future accidents.

The other projects have been successfully implemented and are not restricting or reducing implementation of the Inspector Training project.

Factors contributing to the challenges of the government, inspectors, mine operators, and miners in implementing these programs:

Comment [SM28]: Could be in Project Implmentation and Management Section

1. ***Why has the Ministry of Coal been an obstacle to conducting the demonstrations?***

RESPONSE

Frequent changes in personnel have resulted in the Ministry of Coal being seen as an obstacle to conducting the demonstrations. The government owns and operates most of the older and less profitable underground coal mines, and monetary expenditures are under close scrutiny. Many mines are now being offered for sale to private companies, and those potential buyers are more interested in purchasing only the most viable and profitable mines.

Through the interview process, I learned that, although the Ministry of Coal can be an obstacle, they fault no one else and are quick to compliment the Department of Labor, PEER and Labor Safety efforts.

It is difficult to determine whether it is the Ministry of Coal alone who is the obstacle, or whether the reluctance to change is a product of management personnel at the mines. I did not have the opportunity to question a State owned mine operator about this.

With the exception of the "State secret" data that is not really critical, such as roof strata, it does not appear that the Ministry of Coal is an obstacle in the initial projects that the Labor Safety determined to be of value. However, the monetary requirements needed to continue the projects after PEER funding is depleted does present a problem.

The situation in the Ukraine is unstable and constantly changing. Without their very difficult and costly mining conditions, coupled with their need for coal as an energy source, they probably would not have such a dire need for in-depth assistance in coal mine safety from the United States. The projects that have been selected should result in a reduction of injuries and fatalities.

2. ***Does the Ukrainian Government have the political will and resources to implement the changes that were successfully demonstrated?***

RESPONSE

The Ukrainian Government does have the resources to implement the changes that were successfully demonstrated, but whether they have the political will to do so is questionable. Hopefully, their desire to expand energy recovery will allow the beneficial use of methane degasification from the coal seams ahead of and during mining. The current trend to privatize many of their industries, including coal mines, will assist in improving mine safety. The interview conducted with management personnel from seven privately owned mines was very encouraging. Safety improvements resulting from implementation of PEER project recommendations and methods are readily obvious. Mine management personnel were quick to compliment work on projects being implemented by PEER, and appreciation of mine

safety assistance from the United States was evident during my interview with Ministry of Coal officials.

3. ***Are the mine operators in a position to implement the changes that were successfully demonstrated?***

RESPONSE

As noted above, it is difficult to fund the recommendations and devote the manpower and commitment necessary for the implementation of project changes. My recommendation for possible future projects would be to accentuate the importance of the mine operator and the miners in the safety system as a compliment to the Inspector Training project.

Benefit to or impact on the target population (detailed in PMP):

RESPONSE

The response to this question is the same as the response to question 3 on page 18, which reads as follows:.

The Performance Data Tables (PDT) for three of the projects (Roof Control, Ventilation, and Horizontal Drilling) were provided, and the training summary for the Inspector Training project provides an adequate intended target audience.

Because of the delays in identifying and performing additional horizontal drilling in a gassy mine, the target population has not yet been determined.

Since the Roof Control project was revised to provide a seminar depicting several NIOSH computer simulation programs for ground control, it is apparent that a new target audience was reached

The Ventilation project was completed in 2007 and the interview responses indicate that information was dispersed to all State owned mines and possibly to all of the privatized mines in the Ukraine as well.

Effectiveness and efficiency of project implementation to date in terms of activities completed, materials developed and used, equipment provided appropriate and used, work plan and budget execution.

Comment [SM29]: Project Implmentation and Management Section

- ***Activities:***

1. ***Which activities have been well received by the target audience and why?***

RESPONSE

The Inspector Training project has been met with great enthusiasm from all agencies and parties involved.

Improvements to the ventilation systems at many of the mines were an important prevention measure to address the hazards of methane. The measures that were demonstrated were easily implemented and provided significant improvement at a very low cost.

The potential benefits of an effective horizontal drilling program have been well documented; however, numerous delays have prevented that project from reaching a larger audience and demonstrating even greater methane removal.

As this project moves forward, significant efficiency in the enforcement of regulations, training of inspectors, and progress towards accident and fatality prevention should show trends of success. It is apparent that with these improvements, additional progress will follow.

2. ***Are there any activities that were not well received or were not carried out as planned and why?***

RESPONSE

Implementation of testing of roof bolting concepts was never initiated. The inability to obtain strata data, reluctance to change, and lack of confidence that this would produce viable safety results and be economically feasible created barriers that were too great.

3. ***Has there been any follow-up to these activities?***

RESPONSE

The Horizontal Drilling project has been frequently followed-up with questions regarding when the drilling will begin in a gassy mine. This project has the potential to provide a significant improvement in methane removal since the drill is already in the country and trained drilling personnel are available. It may be time to either mandate action or to provide acceptable reasons for further delay of the project further. Making it clear to the Ministry of Coal that potential loss or reduction of future funding for additional projects could be utilized as incentive to move this project forward.

- ***Materials and Equipment:***

1. ***What training materials have been developed or used by the project, and in which venues were they used?***

RESPONSE

The Inspector Training project is developing numerous inspection forms, accident investigation forms and training material.

In the Horizontal Drilling project, the United States vendor stated that the training of the drilling crews was sufficient and that further drilling should not require their presence.

Initially, the material is being utilized for the inspectors; however, that material will be beneficial to the mine management as the methods and material are being implemented.

2. ***How were these materials received by the participants/target audience?***

RESPONSE

Since the material is being modified to meet Ukrainian needs and desires, the benefits of local ownership and the enthusiasm of the Labor Safety staff involved in the Training Center are becoming obvious.

3. ***Are any changes or additions needed to make these materials more appropriate?***

RESPONSE

Accommodating changes or additions to the material should be relatively seamless and the process of tailoring the material to the desires of the Labor Safety staff and the inspectors receiving the training should logically follow.

4. ***Has the project used or shared the new materials with other projects, organizations, or the ministries?***

RESPONSE

This material is expected to reach many other Ukrainian industries since there are many people in the mining industry and with Labor Safety and Ministry personnel who were initially involved in the coal industry.

5. ***Have they been combined with preexisting materials where appropriate?***

RESPONSE

The Ukrainian regulations and complex mining terminology had to be tailored for all of the training material and procedures. The PEER interpreters and staff needed to develop all appropriate MSHA material into a usable format in the Ukraine, and this was done in a timely and efficient manner. Existing MSHA material provided the basis for this effort.

6. ***Was the equipment provided appropriate for the demonstration?***

RESPONSE

The drilling equipment for the Horizontal Drilling project was suitable for that project and the simple material for improving the internal ventilation leakage of an advancing longwall was adequate.

7. ***Was it well received?***

RESPONSE

In the ventilation project, the standard fire resistant brattice cloth was substituted for local plastic wrapping, so some mines are still following the recommendation. It is critical to insure that any substituted material provided adequate protection in case of a fire. The horizontal drilling equipment may be utilized; however, another drilling site must be decided upon.

8. ***What should be done with the equipment at the end of the project?***

RESPONSE

Labor Safety feels that the horizontal drilling equipment should be placed under the direction of the Technical Center. Completing another drilling site in a gassy mine should provide the information needed to demonstrate the effectiveness of the concept. After that projectis completed, it is my opinion that the drill should be left for Labor Safety to decide on future drilling and ownership.

- ***Work plan:***

1. ***Was the work plan an accurate reflection of the activities that have been carried out to project objectives?***

RESPONSE

The final results of the Ventilation and initial Horizontal Drilling projects provided the desired project outcomes. The ventilation recommendations were simple and relatively easy to adopt. It will require changes by the mine operators, with support from the governing

agencies in providing cost incentives, to further expand their use. With the numerous barriers that might have to be addressed to expand highly efficient methane removal of vertical drilling, the horizontal drilling can produce significant improvement. However, the mine operators do not want to spend extra money on pipe. Without doubt, the effort that is occurring in the Inspector Training project will allow the work plan to be accomplished with the original planned objectives. This will be a major improvement in mine safety at all of the underground mines.

2. What modifications were or should have been made?

RESPONSE

The numerous barriers that were present in the Roof Control project, and changing course to presenting valuable computer simulations utilized in the United States at seminars, indicate that reasonable changes may have to be implemented. Without the in-country oversight of PEER, this project could have resulted in large expenditures and possible risk to the efforts of improving mine safety. Although it would not be noticeable from this project effort, the seed was planted to investigate other European methods that are more similar to the mining methods employed in the Ukraine.

- ***Budget:***

1. How efficiently has the project operated given the resources allocated?

RESPONSE

The long-term relationship of PEER in the Grant implementation role has produced a budget oversight with tight control over expenditures, and is definitely a strength in the funding area.

Demonstration effect of the projects results:

1. ***How were the demonstration results disseminated?***

RESPONSE

Without the opportunity to discuss this with State owned mine operators, field inspectors, and miners, I must rely on observations and interviews with State officials and the privatized mine operator. The fact that a press secretary was involved in at least one interview in each of the three cities was a good indication of project dissemination. In Donetsk, it was reported that the press release on this evaluation was approximately the fiftieth conducted on the PEER projects, so it must be assumed that the PEER projects are very newsworthy.

2. ***Was it sufficient?***

RESPONSE

The mine operator at one of the mines where the Ventilation project took place stated that he believed the dissemination of information was adequate. Without being able to interview all entities involved in the mining process, this question is difficult to answer. However, using statements from the interviews I conducted, which constituted the majority of the evaluation process, I believe the answer to be yes.

3. ***Which actors and/or organizational structures have expressed commitment in terms of the project's demonstrated results?***

RESPONSE

The Ministry of Coal indicated support for most of the projects, whereas Labor Safety indicated a commitment to the Inspector Training project. The mine operator I interviewed, who was with a State owned mine at the time of the Ventilation project, has implemented most of the demonstrated results and even improved upon several of those recommendations.

4. ***In what ways have they committed to implementing the recommendations?***

RESPONSE

The Ministry of Coal and Labor Safety have reorganized the entire coal mine inspection process to address and implement the Inspector Training project to model after the MSHA enforcement agency. As stated elsewhere, this also included modifying all of the programs to be tailored for their requirements.

The privatized mining company has pursued vertical drillholes for methane control as a result of the horizontal drilling project. Although not evaluated as part of this grant review, that same mine has incorporated an indepth personal protective equipment (PPE) program as a result of the demonstrated equipment from another PEER project.

5. ***What are the barriers to implementing the recommendations?***

RESPONSE

The barriers to the Horizontal Drilling project are piping cost, reluctance to change, and the inability to decide where to do the next drilling project. Since an additional entity (State owned drilling company) is involved in this project, increased obstacles are present in the planning process. Also, the frequent personnel changes at the Ministry of Coal and reorganization of that Agency to oversee all energy sources has created delays because of their increased activities.

An effective horizontal drilling program might be sufficient to reduce or eliminate the current required cross measure boreholes; however, testing requires the use of both, so this process

adds additional responsibilities and cost to the existing mining process. With so much emphasis being placed on production without a funding increase, unless a project provides additional coal production, there is little incentive to pursue these ventures.

The lack of commitment and information for the Roof Control project has frustrated this project's support, and it was a wise decision to change this to offering seminars on NIOSH modeling and discontinue the project beyond that.

6. ***Is there a written implementation plan and an identified person or committee responsible for overseeing this plan?***

RESPONSE

The information contained in the TOR, project summaries, and the "Performance Data Tables (PDT)" provides an adequate written plan for each project. Since the PEER staff is relatively small and has Jerry Triplett is a resident of the Ukraine, it is obvious that he is overseeing all of the projects in a management role.

7. ***Is the plan an accurate reflection of the results of the demonstration project?***

RESPONSE

The information provided in the TOR, project summaries and monitoring results in the "Performance Data Tables (PDT)" provides an adequate written reflection of the results.

8. ***Have the demonstration results been adequate to convince the stakeholder to implement changes?***

RESPONSE

This will not be a concern with the Inspector Training project: however, resistance to change at the mine operation level, coupled with a lack of funding from the Ministry of Coal, have been given as reasons why the project's proven methods are sporadically utilized. Following the distribution of the project findings, it appears that the privatized mines are actively utilizing the successful measures. Since the privatized mines and the State owned mines have adopted the methods, progress of the overall goal of reducing accidents and fatalities is occurring.

Project management performance (personnel and communications):

Comment [SM30]: Project Implmentation and Management Section

What have been the strengths and weaknesses of the project management team in the following areas:

1. ***Strategic planning – project cycle, annual, monthly and weekly – based on PMP?***

RESPONSE

With the limited PEER staff, the quarterly status listed in the PDT's should be adequate. More frequent planning may be occurring, but it wasn't assessed during my interview trip. There are several projects that are occurring simultaneously and the personal relationships and contacts are very important, as long as the PDT's submitted to the DOL are adequate for their required oversight.

2. ***Project organization in terms of structure and staff functions at each level of responsibility?***

RESPONSE

Large projects with multiple entities and agencies are managed with minimal personnel, so a large oversight organization is not required. The overhead costs of doing projects in a foreign country are well managed, and project initiations are difficult to implement because of the harsh mining environment. Mine safety and underground coal mining is a unique facet of industry that requires well educated professionals specializing in that industry, so selected staff are well experienced and understand all activity. Labor Safety recognizes that fact that coal mining is managed by experienced personnel.

3. Systematic supervision, monitoring, evaluation and verification?

RESPONSE

This is accomplished in simple and effective methods as explained before. A few highly qualified personnel, dedicated to mine safety, serve to eliminate the need for sophisticated levels of oversight by keeping close contact with the projects. The reporting requirements mandated by DOL are adequate to provide the verification needed.

4. Leadership at each level in terms of quality and timely fulfillment of responsibilities and demonstrated capacity to make decisions and coordinate activities?

RESPONSE

Comments made in interviews made it clear that the leadership qualities of Jerry Triplett and his PEER staff are commendable. They view PEER as a small, but very effective organization that has the ability to request additional professional assistance as required.

Examples include sub-contracting to the University of Kentucky and REI Drilling Company on extensive projects.

5. What support has USDOL provided?

RESPONSE

The trust that USDOL has given the PEER organization has allowed for more timely decision making by the in-country personnel. With limited travel funding for the DOL personnel, project delays and even project cancellations or failures might be possible without this support. The DOL remains committed to the belief that the project goal implemented to improve miner safety in the Ukraine is a worthwhile cause and is changing the coal mine safety effort in that country. The display of the Ukrainian and the United States flags in the Labor Safety offices speaks volumes.

6. In what ways could this be improved or expanded?

RESPONSE

This is a difficult question to answer since a very effective relationship currently exists between remote DOL personnel and the PEER personnel in the Ukraine. The length of time PEER has been involved and their management abilities in the areas of finance and project implementation would be difficult to improve upon. The old adage, "if it's not broken, don't fix it" appears to apply in this instance.

Effective project monitoring, on basis of quality, timeliness and costs:

Comment [SM31]: Project Implmentation and Management Section

1. Is the performance monitoring system practical, useful and cost effective?

RESPONSE

Since this process is required for DOL oversight, it appears to be practical, systematic, and does not result in costly administrative burdens on a small staff.

2. ***Have any problems been encountered with project indicators or the collection and reporting of data?***

RESPONSE

There were not any concerns mentioned during the interviews that indicate any significant concerns in this area. The PDT's are considered to be adequate.

3. ***How has the ongoing collection of data been used to guide project activities?***

RESPONSE

The PDT's not only track the project progress, but include the Immediate Objectives along with a Narrative Analysis. Since this tracks the progress, it is reasonable to assume that this process is also utilized to provide guidance for future activities.

Impact of new methods and techniques:

Comment [SM32]: Should be summarized in the individual project sections.

What have been the strengths and weaknesses of the new methods and techniques demonstrated by the project, including:

1. ***Ventilation?***

RESPONSE

The ventilation methods and techniques were very cost effective and simple to implement in all three areas (external leakage, internal leakage, and restricted airways) involved in the project. Contracting with the University of Kentucky to actually complete the project was a good decision since they have staff instructors experienced in European mining methods.

The weakness of not fully adopting the recommendations is the result of high costs and a hesitancy to change, and rests directly with the mine operators. The Ministry of Coal is thought to be the reason for the lack of monetary resources and incentive because of the belief that all expenditures must result in increased coal production. It is difficult to verify where the actual barrier exists.

2. ***Horizontal Drilling?***

RESPONSE

Since the current methods to reduce methane are limited to the ventilation current and the in-mine cross borehole methane drainage system, the Horizontal Drilling project demonstrated an alternative or addition to the long term practices currently employed. In many of the mines, vertical drilling has several barriers, such as cost, site locations with cities built above the mines, and multiple seam mining. The cross measure boreholes provide some necessary methane removal; however, the mixing chamber method to remove such methane accumulations close to the active may be improved with either horizontal and/or vertical degassing.

A weakness in the project is an administrative concern, in that it is causing an unacceptable delay in determining the next drilling location. Since the next mine chosen will be very gassy, the true benefit of horizontal drilling can not be demonstrated until that drilling is complete and that longwall panel is mined. Because of this, valuable time is being lost.

3. ***Roof Bolting?***

RESPONSE

The strength of this project was a timely recognition that the project could not proceed successfully. Attention and resources were then directed to conducting a seminar on useful NIOSH ground control computer simulations.

It is important when reading this response to remember that I did not receive any information on the conditions or locations where the roof bolting project was scheduled to occur; therefore, my comments may not be valid. A potential liability might have occurred if the project did proceed as originally planned. Automated Temporary Roof Support (ATRS) systems are required in the United States and roof bolting is a primary support system. It is not clear if that would have been a requirement in the Ukraine. European mining may utilize a combination of roof bolting and arch support by expanding the arch distance requirement. Since a leading cause of fatalities is roof and ground failure in the Ukraine and arch support is the principle method, both in the installation and required removal for longwall mining, any change to this method might result in an unforeseen serious injury or fatality. Unless all of the current MSHA requirements, training, and industry standards were implemented along with the project, unintended results could be devastating, and questions could arise regarding the assistance provided, especially since the general attitude is that of resistance to change.

4. ***Inspector training?***

RESPONSE

The approval from the Ministry of Coal and the total commitment of Labor Safety will allow this important project to move quickly toward the intended goal. It compliments the other PEER project of adopting a computer record keeping and accident analysis program, currently being developed by the University of Kentucky in their capacity as a sub-contractor for PEER. Both programs allow for the systems to be tailored to the needs of Labor Safety. The Training Center for inspector training in Lugansk is progressing at a rapid pace and is being modeled after a smaller scale MSHA Academy in Beckley, West Virginia.

Weaknesses in this project have not been noted since the Kiev and Donetsk regions are equally enthusiastic about the progress to date. All three major entities commented on the importance of this project and the quality of the PEER staff overseeing it.

Lessons Learned:

Comment [SM33]: Should be in Lessons Learned Section.

1. ***What has the project done effectively?***

RESPONSE

An additional method of lowering methane levels in underground coal mines was demonstrated, utilizing simple horizontal drilling and demonstrations of simple ventilation improvements that will most likely result in increased safety and lower electric costs associated with the mining of coal.

Adoption of the MSHA enforcement, investigation, and training system by the Ukrainian agencies has been implemented at a rapid pace, utilizing well qualified and dedicated professionals from the United States.

2. ***What specific changes in implementation might produce better results?***

RESPONSE

In projects where expensive equipment is required, a consideration would be for the Ukrainian State to accept a timeline for the projects and purchase a portion of the equipment themselves. Reimbursement for that equipment from the USDO could be forthcoming when a project meets minimal expectations. I believe the Ukrainians need to demonstrate the same level of commitment to projects for safe mining that the USDOL provides.

3. ***What are some of lessons learned regarding the non-participation in/with the project, in terms of the Government, mining companies, miners, other applicable groups?***

RESPONSE

Total commitment must be demonstrated by all entities, before project implementation can be successful. Labor Safety for coal mining and PEER personnel experience frustration regarding projects that have been approved by multiple agencies and entities, only to be delayed after the initial startup. The success and timely progress in the Inspector Training project, which is concentrated between Labor Safety for coal and the PEER staff, demonstrates the efficiency that can be accomplished when fewer agencies or entities are involved in the implementation of a project.

EVALUATION METHODS – FROM TERMS OF REFERENCE

The evaluation methodology will consist of the following:

1. Document review

- ***Project document***

RESPONSE

The documents provided were reviewed prior to the interview trip.

- ***Strategic framework***

RESPONSE

This would be considered the project description in the TOR.

- ***Work plans***

RESPONSE

The Performance Data Tables provided included sufficient descriptions for the projects and the project summaries provided previously for the Ventilation and Horizontal Drilling projects satisfied the material required for the evaluation.

- ***Quarterly reports***

RESPONSE

The Performance Data Tables were reviewed prior to the interview trip.

- ***Trip reports***

RESPONSE

These reports were not reviewed, and their importance was not determined to be required for an adequate evaluation. The summary status of training conducted to date on the Inspector Training Project provided adequate information.

- ***Training materials***

RESPONSE

Extensive training material currently being utilized in the Inspector Training project was forwarded to me by PEER personnel.

- ***Event reports***

RESPONSE

Specific event reports were not provided or deemed necessary to perform the requested evaluation process.

2. ***Planning meeting:***

- ***USDOL***

RESPONSE

The planning of the evaluation process was accomplished through the e-mailing of pertinent documents and one telephone conference call.

- ***Evaluator***

RESPONSE

Information or material required to perform the evaluation was either provided before the interview trip or during my stay in the Ukraine.

- ***Project staff to discuss evaluation:***

i. Protocols

RESPONSE

PEER discussed the project protocols both in the pre-trip correspondence and during interviews conducted in the Ukraine. Only the Inspector Training program has active involvement until the Horizontal Drilling project results in another in-mine selection.

ii. Logistics and work plan

RESPONSE

The Inspector Training project has been the main focus of PEER involvement during the last several years, and that activity has been in-depth. There are several other on-going projects that are not being evaluated at this time. The number of training sessions conducted, the modifications to tailor MSHA material to Ukrainian needs, and initiating the logistics to establish the Training Center in Lugansk is well under way.

iii. Methods, type of data required

RESPONSE

Examples of the training material to be used during the training of inspectors are already converted into the local language, and the forms required for documenting inspections and investigations is complete.

iv. Responsibilities and products

RESPONSE

The Inspector Training project, unlike the other projects in which PEER had to take the leadership role in sub-contractor selection and original implementation of the projects is progressing nicely. It is obvious that the Labor Safety staff is progressing independently with recommendations and planning in between site visits from PEER representatives. As this project progresses, I believe it will be viewed as a Ukrainian improvement in mine safety with limited assistance from the United States, rather than projects that look like the entire concepts are driven from outside the Ukraine.

3. Interviews (individual or in groups) of key informants:

- ***USDOL project manager***

RESPONSE

The conference call conducted prior to the interview trip and material forwarded to me following the call was sufficient in conducting the evaluation.

- ***U.S. Embassy staff***

RESPONSE

A representative of the United States Embassy was interviewed; however, he had only been in the Ukraine for two months. Nevertheless, he was well aware of PEER and the current Grant projects. The week after I interviewed him, he planned to travel to Lugansk to visit the mines in that region. The reputation of the PEER group, the projects in progress, and their relationship with the Ukrainian agencies involved, allowed him to express his confidence in this effort to improve mine safety.

- ***Training participants***

RESPONSE

The management personnel of Labor Safety had received the Inspector Training project training sessions and were very impressed; however, no inspectors or field supervisors were interviewed.

- ***Representatives of the State committee for labor safety and the Ministry of Coal***

RESPONSE

Officials representing both agencies were interviewed.

- ***Relevant department staff such as inspectors,***

RESPONSE

Individual inspectors were not available for interviews.

- ***Other stakeholders (e.g. demonstration mine management and miners, drilling company staff)***

RESPONSE

Two mine management employees from a privatized mine were interviewed, and three employees of the State owned drilling company were interviewed.

4. Field visits for verification

RESPONSE

There was no opportunity for field visits, other than to the State agencies in Kiev, Donetsk, and Lugansk.

5. Data matrices

RESPONSE

The Performance Data Tables for all of the projects were adequate to track the progress of the projects.

6. Post field visit meeting

RESPONSE

There are no plans for any post field visits.

This is not a formal impact assessment. Findings for the evaluation will be based on information collected from background documents and in interviews with stakeholders, project staff, and beneficiaries. The accuracy of the evaluation findings will be determined by the integrity of information provided to the evaluator from these sources.

Furthermore, the ability of the evaluator to determine efficiency will be limited by the amount of financial data available. A cost-efficiency analysis is not included because it would require impact data which is not available.

POSSIBLE FUTURE GRANT CONSIDERATIONS

Comment [SM34]: Change the tiitle to Recommendations

A request to provide my recommendations for possible future project considerations was made during the pre-visit telephone conference with DOL and PEER staff.

As the Inspector Training project progresses, this should be an opportune time to integrate two other very important legs of a successful mine safety program triangle. The enforcement leg is being initiated first and is an important facet to *"establish what is right"* and to support that premise with a rigid inspection and enforcement program. However, it is up to the mine management to *"do what is right,"* which is the second critical leg of the safety triangle. The third and final leg of the triangle is the empowerment of individual miners to *"do their best"* and take all necessary steps to insure their safety, as well as the safety of their fellow employees. The last two legs usually combine for in a strong and effective mine safety program. When safety success is achieved, each of the three legs of the triangle becomes equally important.

The mine visits to the United States by Ukrainian State employees could be augmented by additional visits to progressive mines that boast strong safety programs. The Ukrainian personnel have been exposed to the strength of the MSHA enforcement process, but they have not been exposed to an effective mine safety program at a truly committed safety oriented mine. This is not to insinuate that the mines that were visited didn't meet this need; but rather, the visits were not specifically directed toward investigating the safety systems in place at those mines.

I also believe that the Ukrainian mining industry should reciprocate by sharing their unique experiences in dealing with difficult mining conditions and mining in deep, gassy, and steep seams prone to spontaneous outbursts of methane. My interviews touched on the type of research that the Maknii Institute has conducted, which may be of interest to the United States, such as their spontaneous combustion of coal studies. They are mining seams that may be in the long-term future of United States coal mining. I expect that if the exchange were of mutual benefit to both the Ukraine and the United States, a sense of pride might raise the level of participation in the projects.

Labor Safety has a list of possible future projects that they have determined would be beneficial. That list was given to me during the Kiev interview and will be attached to the Final Review. That list is not printed in English, but it is currently being interpreted.

APPENDIX A

EVALUATION SCHEDULE

PARTICIPANTS:

PEER: Jerry Triplett
Joe Pavlovich
Valentine Chukhalov
Natasha Zolotaryova

Program Evaluator: Link Derick

SCHEDULE:

DAY	DATE	AGENDA	CITY-HOTEL
Friday	25-Feb	Depart US	
Saturday	26-Feb	Arrive Kyiv, Ukraine	Kyiv-Hotel Dnipro
Sunday	27-Feb	Rest	Kyiv-Hotel Dnipro
Monday	28-Feb	Fly to Donetsk Interview Drilling Company	Donetsk-Hotel Centrel
Tuesday	1-Mar	Interview Donetsk Labor Safety	Donetsk-Hotel Centrel
Wednesday	2-Mar	Drive to Lugansk Interview Lugansk Labor Safety	Lugansk-Hotel Druzhba Plus
Thursday	3-Mar	Interview Lugansk Labor Safety Interview PEER Staff	Lugansk-Hotel Druzhba Plus
Friday	4-Mar	Fly to Kyiv	Kyiv-Hotel Dnipro
Saturday	5-Mar	Open	Kyiv-Hotel Dnipro
Sunday	6-Mar	Open	Kyiv-Hotel Dnipro
Monday	7-Mar	Interview US Embassy	Kyiv-Hotel Dnipro
Tuesday	8-Mar	Interview PEER Staff	Kyiv-Hotel Dnipro
Wednesday	9-Mar	Interview Kyiv Labor Safety	Kyiv-Hotel Dnipro
Thursday	10-Mar	Interview Kyiv Labor Safety	Kyiv-Hotel Dnipro
Friday	11-Mar	Interview Kyiv Coal Officials	Kyiv-Hotel Dnipro
Saturday	12-Mar	Depart Ukraine 05:30 to Frankfurt	

Purpose of Trip: a requirement of receiving a grant from the US Government is that an independent program review must be conducted at the end of the grant implementation. Mr. Link Derick has been retained to perform the independent review and he will need to interview various officials that were involved with the implementation of the program. The program segments that will be evaluated include directional drilling, ventilation, roof control, and the first phase of inspector training. The program review will take place place in Ukraine during the period of Feb. 26th through March 11th.

Contact Information:

PEER Kyiv office telephone/fax	380-44-278-0623
PEER Donetsk office telephone/fax	380-62-337-6001
Kyiv Hotel Dnipro	380-44-254-6777
Lugansk Druzba Plus Hotel	380-642-55-38-77
Donetsk Hotel Central	380-62-332-3875
Triplett mobile phone	380-50-472-2343
Chukhalov mobile phone	380-50-347-2112
Zolotaryova mobile phone	380-50-422-4692
E-mail address	trip@public.ua.net

APPENDIX B

INTERVIEWS CONDUCTED

(Single space names – all in same interview)

MINISTRY OF COAL INDUSTRY
(State Holding Company - Drilling)

Viktor Turchyn – Chief Engineer – February 28, 2011 - Donetsk
Alexander Krasnoschok – Deputy on Safety – February 28, 2011 - Donetsk
Anatoly Gorelkin – Deputy on Production - February 28, 2011 - Donetsk

DONETSK REGIONAL LABOR SAFETY

Konstantin Durofeev – Director – March 1, 2011 – Donetsk
(All 39 Industries in Donetsk Region)

Viacheslaw Korol – District Manager – March 1, 2011 – Donetsk
(Coal Mining in Donetsk region)
Marina Nikitina - Press Secretary in interview
Alexander N. Garbuzov – Deputy – March 1, 2011 - Donetsk
(Deputy of Alexander M. Simonov)

LUGANSK REGIONAL LABOR SAFETY

Sergei E. Topchiny – Director – March 2, 2011 – Lugansk
(Oversees Technical Center in Lugansk)
(Reports to Regional Labor safety)

Victor V. Steblin – Deputy - March 2, 2011 - Lugansk
(Deputy to Sergei E. Topchiny)
(Oversees Inspector Training Program)

Nickolai S. Skarbenko – Field Office Manager – March 3, 2011 – Lugansk
((Deep and Hazardous area mines)

Eugene P. Mischenko – Manager of Inspections – March 3, 2011 – Lugansk
(Methane gas and coal dust hazard mines)

MINE OPERATOR –Krasnodon Coal Company
(Privatized mine operator of seven mines)

Pavel Y. Muisseenko – Mine Manager – March 3, 2011 - Lugansk
Sergei V. Moskalenk – Chief Electrician – March 3, 2011 – Lugansk
(A Press Secretary was also in the interview
(Schodolskaya-Vostochaya mine was involved in the Ventilation Project that was eventually turned to a privatetized mine.)

EMBASSY OF THE UNITED STATES OF AMERICA

Marc B. Gartner –Economic Officer – March 7, 2011 – Kiev

KIEV - LABOR SAFETY

Oleg N. Rumezhak – Labor Safety – March 9, 2011 – Kiev
(Currently - Labor Safety – all industries – Kiev Region)
(Past – Director of all coal mines – Ukraine)

Victer A. Shaitan - Labor Safety – March 10, 2011 - Kiev
Evgeny S. Stepanuvsky – Labor Safety – March 10, 2011 – Kiev
Gennadiy M Suslov – Deputy Director – Labor Safety – March 10, 2011- Kiev
(***Alexander I. Chekhov*** is the Director for Labor Safety but couldn't attend)
(A Press Secretary was also in the interview)

Sergei Storchak –- March 9, 2011 - Kiev
(Currently with a privatized Drilling Company)
(Past – Director of Labor Safety)

MINISTRY OF FUEL AND ENERGY (COAL DEPARTMENT)

Vladimir V. Fichov – Deputy Minister – March 11, 2011 - Kiev
(Ministry of Coal Industry of Ukraine)

PARTNERSHIP FOR ENERGY AND ENVIRONMENTAL REFORM (PEER)

Valentine Chukalov – PEER – March 3, 2011 - Lugansk

Jerry Triplett – President of PEER – March 8, 2011 - Kiev

Joe Pavlovich – Vice-President of PEER – March 8, 2011 – Kiev

Natasha Zoletaryova – PEER – March 9, 2011 – Kiev

APPENDIX C

SUMMARY AND SAMPLE OF INTERVIEW RESPONSES AND RELATED INFORMATION ON UKRAINE MINING METHODS

VENTILATION PROJECT

Ministry of Coal supported the original projects, but does not necessarily support continuation of the projects at each mine. It is up to the mines to continue the effective projects. The Donetsk Ministry reported that most mines have discontinued the use of rock dusters due to lack of funding. They have reverted to their old sealing method rather than using the brattice cloth in the gateroad leakage controls.

There are five categories of mines, from the least hazardous not requiring permissible equipment to the most hazardous, which include mines with large methane liberation that are prone to spontaneous outbursts. Several categories require Atmospheric Monitoring Systems (AMS) for methane monitoring. Newer regulations will require permissible equipment and AMS detection for methane in all mines.

About 60% of longwalls are retreating and 40% are advancing. The decision to utilize the advancing longwall method is usually predicated on the depth of cover and the likelihood of spontaneous methane outbursts, but can also be implemented when development is falling behind.

Fan house recommendations are still being implemented, and some areas where deterioration has occurred have been replaced with welded metal sheets.

HORIZONTAL DRILLING PROJECT

The Ministry of Coal did assist in the selection of a mine for the Horizontal Drilling Project, and is still assisting in the selection of another mine to continue the project.

The Ministry of Coal recently met with the Coal Institute and four major issues were prioritized, with the Horizontal Drilling Project being their second priority.

The current State regulations require cross measure boreholes.

Approximately 70% of current de-gassing systems vent to the atmosphere.

Approximately 60% of Ukrainian mines could use horizontal drilling.

Upon additional testing of horizontal drilling, the possibility exists that this method could replace the cross measure boreholes.

Ministry has an interest in vertical degassing, but lacks the funding for implementation.

Having PEER personnel living in the Ukraine resulted in a timely solution to a problem that occurred during the horizontal drilling.

The Drilling Company was apprehensive about drilling on another site since it was reported that they weren't paid in full for the first drilling project, as reported by the Ministry of Coal.

Without horizontal directional drilling from the surface, the current horizontal drilling is only useful in the retreat longwall mining method.

The drilling equipment has been idled and in storage for in excess of two years.

Ministry of Coal has a concern with the cost of pipe required for horizontal drilling.

Ministry of Coal is investigating the capture of gas for usage along with several other countries.

The Drilling Company is pleased with the equipment, the training their operators received, support from an American drilling company, and especially PEER.

Vertical drilling is difficult in many minesites since towns are built over the mines.

Ministry of Coal in Kiev has had five Ministers in the last five years, so choosing another minesite has been difficult.

Minesites are apprehensive about adopting new ideas.

Mine personnel believe cross measure boreholes are cost effective and cannot afford the drilling cost and pipe for horizontal boreholes.

A privatized mine that was a State operated mine during several projects, is utilizing vertical and horizontal drilling. The company manager was with the mine when it was State operated and projects were initiated, and he worked with PEER for years. This company now has seven mines in the Ukraine and also has operations in the United States.

The privatized mine has remote villages on the surface so can do vertical drilling. They recover some methane for on-site generators and flare some of the methane, but are exploring more usage of the gas being emitted. These operations are utilizing several of the rock dusters, are still using water filtration and water softeners, have newer personal protective equipment, and have installed "recommendation boxes" throughout the mine. It is interesting that the same workforce (approximately 2,000 employees at the seven mines) is still present from when it was a State owned mine. It was reported that changing the workforce attitude towards safety equipment and procedures was a challenge, but it was accomplished.

Labor Safety in Kiev stated that delays in the Horizontal Drilling Project are resulting from lack of support from the Ministry of Coal and not from any activity of PEER personnel.

The Labor Safety in Kiev further stated that the more gassy mines in the Ukraine need to continue horizontal and vertical drilling for removal of the methane from the caved gob.

The Labor Safety in Kiev also stated that the permissible equipment utilized and manufactured in the Ukraine (longwall equipment, shearers, and road head miners) is as effective as any that could be imported. However, a combination of methods utilized internationally should be reviewed for ventilation of methane.
The Deputy Minister for the Ministry of Fuel and Energy's Coal Department was employed by a company that implemented vertical drilling for methane removal in the Ukraine.

All levels of officials interviewed expressed difficulty with spontaneous outbursts of methane from the deep cover. Research being conducted and performed at the Maknii Institute may be of interest to the United States, not only on methane procedures, but topics like spontaneous combustion research on coal.

Current Labor Safety in Kiev believe that they were provided with the best United States experts for the Ventilation Project. The University of Kentucky (UK) personnel were well versed in Polish and European mining methods. They were also impressed with the UK ventilation simulation development.

The current Labor Safety in Kiev is also recommending that the next drilling site be in a very gassy mine. They would like the drilling project to be taken over by the Technical Center. There is also a dispute over who will be the final owner of the drill.

ROOF BOLTING PROJECT

This project was to be implemented in the Lugansk region only.

Roof strata data is public in the United States, but is a "State secret" in the Ukraine.

Donetsk Labor Safety was enthused about University of Kentucky research on spontaneous outburst prediction, but was disappointed that the project failed to be implemented. This was especially a concern after eight miners were lost in a spontaneous outburst in July of 2010.

Labor Safety in Kiev has visited several Polish mines to review that country's usage of roof bolting and arching combinations. These visits also demonstrated the cable truss installation and the British five-piece arches. The Polish method has allowed for a greater arch spacing, thus reducing cost and installation and removal frequencies. One of the mines visited had depths of 1,000 meters and the combination roof support provided excellent conditions.

The Labor Safety in Kiev also stated that an experimental project is in progress in a privatized mine is to utilize roof bolting and arching.

INSPECTOR TRAINING PROJECT

Donetsk inspectors are trained at the Lugansk training centers and now rotate the mines that they inspect.

All mines must have Deputy of Safety in their management organization.

Inspectors enforce all laws and inspect both State operated as well privatized mines.

Donetsk Labor Safety believes the personnel selected by PEER for training of inspectors are very professional.

This program has a great chance of total success since only Labor Safety is involved and it does not have to be accepted by mine management. This statement was confirmed by Labor Safety personnel in Kiev who stated that they are confident that "real training" will result that will definitely improve the inspection effectiveness.

Training hours for inspectors will be increased in the future at the Lugansk training facility.

PEER personnel, especially Jerry Triplett and Joe Pavlovich, are of critical importance. The Training Center activity is being accelerated quickly for fear that personnel or projects can change.

The Training Center in Lugansk, with assistance from PEER, is beginning computer entry for inspectors' activities, and I was told that the PEER approach has been effective and accepted. Information is being disseminated to mine operations, supervisors, and even vendors.

The Labor Safety in Kiev believe the Inspector Training Center in Lugansk will have a computer training room of 15-20 computers, a large lecture room, and four instructor training rooms in the future. These goals indicate that the Grant Project is only providing the demonstration of process and initial equipment, and that Labor Safety will expand the project at Ukrainian expense.

The current Labor Safety in Kiev stated that nothing was imposed on them and all questions and desires for the program were Ukrainian driven, coupled with a great working relationship with the PEER group.

Both Jerry Triplett and Joe Pavlovich have received awards from Labor Safety. The Kiev office believes the PEER relationship has been the deciding factor in the success of the projects. They believe that PEER employees have been exceptional and that Joe Pavlovich can grasp their comments with little explanation. They also believe that Jerry Triplett is an excellent manager who has hired knowledgeable Ukrainian personnel.

.MISCELLANEOUS COMMENTS

Currently, approximately 50% of the coal mined in the Ukraine is from State owned mines and the remaining coal production is from privatized mines. Since the State owned mines are usually the older operations and have more difficult mining conditions, there are more State owned mines than privatized mines.

Mining in the Ukraine is very diverse, with methods ranging from "pick and shovel" to longwall mining. Many of the Ukrainian mines are under deep cover, are very gassy, have steep mining conditions, and range from steam coal to metallurgical coal, even including some anthracite coal.

Most major events result from failure to follow regulations, as determined by their own investigations.

Uncontrolled events, such as spontaneous methane outbursts, constitute approximately 3% to 5% of total events.

It was stated that approximately 50% of mine inspections result in an area of the mine being closed until an infraction is corrected. With mine inspectors normally assigned the same mine until recently, all phases of the mine being operated by being State employees, and a significant portion of the miners' pay being dependent upon production, this statement seems questionable.

Donetsk Ministry of Coal stated that root causes of accidents are determined and recommendations must be implemented before production resumes. This statement seems questionable since others stated that an investigation is considered complete once an individual is determined to be at fault.

Most investigations must be completed within ten days; however, an extension can be requested until qualified technicians are available to perform the investigations.

Several mines are prone to spontaneous combustion of the coal seam and have utilized inert gas injection or chemical inhibitors.

Even off-site fatal heart attacks are considered to be work-related in some instances.

Front line supervisors must have mining engineer degrees and inspectors must have extensive mining experience.

Comments were made that individual miners are encouraged to take chances since being risky is considered heroic and being cautious is considered cowardly. Most do not believe an accident will happen to them.

The comment was made that a substantial portion of the miners pay is for production and they are praised for production; however, if they get injured, they are looked down upon. A follow-up response in a different interview stated that about 30% to 40% of pay is production based, which results in frequent risk-taking.

Seams of 0.75 meters must be mined unless Labor Safety makes an exception.

The European management systems are being tested at several mines that stress the roles and responsibilities of all management positions. Increased safety and higher production has been reported at these mines.

All Ukrainian enforcement personnel have extensive mining backgrounds, especially for the gassy and hazardous mines.

PEER has been in the Ukraine since 1993, and Jerry Triplett has been in charge of PEER since 1997.

Information requested on a 2002 explosion at the Barokova Mine, which was a coal dust explosion resulting from melted oxygen cylinder, was briefly discussed. The area was under construction when the explosion occurred, with no methane but lots of coal dust.

The United States Embassy believes that PEER provides valuable assistance in coordinating visitors to the mines, has an excellent relationship with all of the Ukrainian agencies, and is an excellent example of United States ambassadorship.

The United States Embassy also believes that the PEER Grant projects have been valuable, effective, and require very little oversight from the Department of Labor and the United States Embassy. The Embassy staff changes frequently; however, PEER personnel have a long-standing presence in the Ukraine.

The money to operate many of the State owned mines is channeled through "Cash Intermediaries", which evaluate monetary requests from the mines to determine if the expenditure will increase production. Requests to expand or continue items proven to be effective by the PEER projects get delayed due to this criteria. These "Cash Intermediaries" also control coal sales from the mines.

The Accident Reporting and Analysis and Record Keeping projects started from scratch, with the University of Kentucky implementing this project. The Inspector Training project is being implemented by modifying existing MSHA programs to tailor them to Ukrainian needs.

After the disaster in 2002, the University of Kentucky was to be awarded the Grant to improve mine safety in the Ukraine from a government earmark. However, since PEER had the mechanisms and personnel to coordinate projects in the Ukraine, the projects were awarded to PEER from the Department of Labor, with the implementation being awarded to the University of Kentucky.

PEER believes that future projects should include wireless communications since many mines already have an infrastructure of mine-wide monitoring systems.

PEER has gained assistance from Bevill State Community College in Sumiton, Alabama, to initiate the computer network that the Training Center in Lugansk will need to continue the Inspector Training Program.

PEER personnel provided me with an effective crash course during the interviews to gain a more effective understanding of the single entry mining system, the advancing longwall mining method, and the arch installation and packwall construction system. This information was vital in the evaluation of several of the projects for the Grant review, especially the Ventilation project, Horizontal Drilling project, and the Roof Bolting project.

PEER personnel explained how the another grant project of Accident Reporting and Analysis compliments the Inspector Training Project of this Grant Review by providing the statistics as to where increased agency oversight is needed from the inspection branch.

The Labor Safety in Kiev stated that coal recovery at the current level could last for centuries; however, even greater depths and limited coal heights will be encountered.

Former Director of Labor Safety for all coal mining, who has been in that position throughout the projects' existence, commented that all of the PEER personnel were "highly qualified professionals," adding that he hopes Jerry Triplett doesn't ever become homesick and leave the Ukraine.

I was amazed at how many of the top Ministry of Coal or Labor Safety personnel who now have duties in all industries have a coal mining background. The statement was made that personnel trained in coal mine safety can be very effective in any industry's safety; however, the reverse is not necessarily true.

Ministry of Coal official stated that their relationship with PEER personnel is great, and that the money needed for continuation of PEER projects rests with the Ministry of Coal. The new Ministry will now be overseeing all energy production in the Ukraine.

The Ministry of Coal official further stated that in the future, they will require the utilization of vertical degas drilling for both the safety of methane removal and energy production from that methane on the surface, possible shale gas drilling, and the need for "tracking and communication" systems.

An additional comment from the Ministry of Coal official stated that Jerry Triplett is great to work for and he will "drive a project to the very end". The relationship between all PEER personnel and Labor Safety is also very good.

I discussed my belief in possible future projects involving a review of safety programs of major progressive mining firms in the United States and other countries for the management compliance and accident prevention efforts that also include the miners. It was stated that, at the present time, management at the State operated mines just do not have time to undertake this task because of their other duties and distractions.

Current Labor Safety in Kiev stated that the Ministry of Coal had little involvement for project selections and implementation, and that their organization had the lead role.

Once the rock dusting project was completed with PEER, Labor Safety stated that they had developed mini-dusters that could be carried on employees' backs; however, they felt that the PEER project exchange gave them the incentive to investigate new procedures and equipment on their own.