ALPHA FOUNDATION FOR THE IMPROVEMENT OF MINE SAFETY AND HEALTH

CALL FOR CONCEPT PAPERS

Program Overview

The Alpha Foundation for the Improvement of Mine Safety and Health, Inc. (Foundation) was established as part of a Non-Prosecution Agreement (Agreement) entered in December 2011 by the United States Attorney's Office for the Southern District of West Virginia, the United States Department of Justice and Alpha Natural Resources, Inc. (Alpha) and Alpha Appalachia Holdings, Inc. This Agreement was related to the explosion at Upper Big Branch (UBB) Mine, an underground coal mine owned by Performance Coal Company, a former affiliate of Massey Energy Company, which Alpha acquired in June 2011, over a year following the UBB explosion. Pursuant to that agreement, Alpha agreed to establish a trust to fund projects designed to improve mine safety and health by providing 48 million dollars into the trust.

These funds will be used to award grants to qualified academic institutions and other not-for-profit organizations. Grant awards will be based on a two-stage competitive proposal process: (1) applicants submit a concept paper that describes the problem area that is being addressed, proposed solution and estimated cost for doing the work, and if invited; (2) applicants will then submit a full proposal with a detailed technical approach and budgetary needs for final review and consideration. ***This solicitation is addressing only the call for concept papers.*** Full proposal submission requirements will be provided by the Foundation to those who are invited to submit full proposals based upon their concept paper evaluation. Awards of selected proposals are planned by the end of summer, 2013.

Reduction or elimination of mine-related injury and disease must be based on sound research. For a number of years various government agencies, universities, industry, product vendors, and other entities have engaged in research related to mine worker safety and health and provided products and research outcomes that have improved miners' lives. The Foundation hosted a stakeholder meeting in 2012 in order to identify priority areas for research on mine safety and health, specifically asking participants to identify gaps in existing research efforts. As a consequence of that meeting, the Foundation has determined its highest priority is to fill the research gaps identified and to explore new initiatives that complement currently funded research on mine safety and health. In this first call for concept papers issued by the Foundation, research projects are being sought in four areas that concern the safety and health of miners in the United States: 1) Safety, 2) Health, 3) Safety and Health Management, and 4) Training.

The Foundation seeks to engage the best researchers, of any discipline and expand the field of research expertise that can provide solutions to complex mining safety and health problems. Practitioners, policy-makers and researchers from disciplines and settings outside of mining are encouraged to interact with mining entities to gain a full understanding of the mining environment, particularly when access to a mine is required, to fulfill the project objectives. Projects that include matching grants from other sources are also welcomed.

Purpose and Vision

The goal of the Foundation is to enable miners in the future to be free of work-related injury or disease by the implementation of the results of the projects funded by the Foundation.

Pursuant to this goal, the Foundation is seeking to award research addressing the root causes of disease, injuries, and fatalities in the mining industry and achieve successful implementation of practical solutions derived from the research effort. To this end, cooperative research efforts with mining entities, stakeholder groups and state and federal institutions are encouraged. The Foundation is committed to fund projects that explore innovative ideas and concepts, complement existing research efforts and address knowledge or technology gaps in mine safety and health. In addition, the Foundation believes a balanced approach, incorporating a blend of engineering and health science with behavioral science and training, is needed to solve these mining safety and health problems.

A major aim of the Foundation is to support research projects that have practical implications for mine safety and health workers, operators, and policy-makers. For this reason, a particular emphasis is placed on the early translation and rapid dissemination of project findings. Once the findings are available, grantees will be required to develop and disseminate a research brief on the findings.

Eligibility Criteria

Concept papers will be accepted only from U.S.-based, academic institutions and not-for-profit organizations qualifying as exempt from taxation under Section 501(c)(3) of the Internal Revenue Code. If the Proposer is invited by the Foundation to submit a Full Proposal, the Foundation may request a current copy of the organization's IRS Determination Letter or a statement from the academic institution describing its formation and status as a tax-exempt entity organized and operated exclusively for educational purposes.

In addition:

- Proposed projects must be relevant to the U.S. mining industry.
- Consistent with Foundation values, this program embraces diversity and inclusion across multiple dimensions such as race, ethnicity, gender, age and disadvantaged socioeconomic status.

- When appropriate, proposals are encouraged from applicants who can help expand the perspectives and experiences beyond that traditionally utilized in mining to meet the goals of the Foundation.

Specific Aims and Research Focus Areas

Mining continues to be a dangerous occupation as evidenced by the recent disasters caused by deadly explosions and ground instabilities, along with the evidence of new outbreaks of silicosis among both underground and surface miners. Surveillance data indicate mining historically has one of the highest occupational injury rates. In addition to safety concerns, mining suffers from a variety of health-related issues including coal workers pneumoconiosis (black lung), musculoskeletal disorders, and hearing loss, coupled with an aging workforce and changing demographics. Several studies have shown that a key component of prevention of injuries and fatalities in all occupations is improving the safety culture and instituting an effective safety and health management system. As such, training is also an important element of safety and health intervention.

The Foundation is seeking to expand the knowledge base of mining safety and health information that can lead to resolving complex mining problems. To that end, the projects funded by this effort are designed to provide a spectrum of knowledge potentially encompassing the following:

- ***Surveillance data*** – Collect and analyze surveillance data that better documents the prevalence and trends of occupational safety and health across the mining industry.
- ***Fundamental data*** – Engage in activities such as field studies that produce fundamental data sets that expand the knowledge base and drives advancement of the science.
- ***Root cause analysis*** – Address basic scientific phenomena that relate to the root causes of mining related disasters, disease, injury and accidents. This would include the evaluation of exposures and conditions that confer the increased risk of adverse safety and health effects.
- ***Control and intervention*** – Implement and evaluate new intervention and prevention programs, and expand current controls to prevent unsafe conditions and health risks from developing.
- ***Improved sampling techniques and strategies*** – Explore opportunities created from recent technological evolution to collect and manage critical information that can enhance the warning and prevention of a mine disaster.
- ***Performance assessment of innovative technology developments*** – Collect basic data to evaluate the performance characteristics and/or limitations of recently developed safety and health technologies.
- ***Need assessments/design criteria*** – Provide supporting information that can be used to define criteria for design of engineering controls or safety technologies. This could also include demonstration of the calculation of safety integrity levels (SILS) for new mining technologies and means to adopt international safety standards.

- ***Innovative approaches to training*** – Develop state-of-the-art or novel training methods and techniques that can be tailored to the unique environment and demographics found in the mining industry. These methods can be applied to the individual or groups and should encompass measures of success and competencies.
- ***Organizational change*** - Evaluate the impact and implementation of safety and health management approaches and systems (SHMS) within the current culture and regulatory and compliance framework. A key focus is to develop approaches that assess and integrate SHMS into an effective safety culture, empowering employees to assess risk and effect change in the working conditions and/or mining process.

In this first call, the Foundation has identified four broad areas that proposers can address when submitting concept papers: 1) Safety, 2) Health, 3) Safety and Health Management, and, 4) Training. A description of the specific aims with some example topic areas for each area is provided below.

Focus Area 1: Safety

Accidental fatalities and injuries across all types mining have steadily decreased over the years, but mining still has a higher risk of injury than most other occupations. Better engineering of mining systems for improved safety has played a key role in the accident reductions seen to date, and still has a role in further preventing disasters and reducing mining accidents.

The focus of this area includes the following major topics:

***Design and Technology for Prevention*:** The Foundation is seeking research that will enhance intervention through engineering design and development of new technologies in the following areas:

Ventilation and Dust Control: Proper ventilation design and dust control are core mining functions that are critical to eliminating fires, explosions and control disease associated with dust exposure. While considerable research has been accomplished in this area, new questions have been raised following recent disasters; in particular, there is a need to resolve the float coal dust problem.

The Foundation is particularly interested in investigating research topics that include:

- Development of technologies or enhanced methods for eliminating or suppressing the generation of (float) dust at the source and keep it from escaping into the mine workings.
- Methods to control methane releases that can overwhelm the ventilation system.
- Measurement of longwall gob methane releases into the working face, particularly in the tailgate region of the face, and assessment of the ventilation dynamics that aggravate or control it.

- Investigate feasibility of ventilation-on-demand with modern monitoring and control technology.
- Assessment of coal dust dispersion relative to particle size (i.e. float coal dust) and ventilation levels. This effort could also include development and verification of a predictive model for coal dust dispersion and rock dust metering requirements.
- Fundamental studies to explore the potential and practicality for particle charging technologies to reduce dust generation.

Ground Control**:** The ground control area encompasses the design, monitoring, and control of the roof, ribs, and slopes at mines. Challenges remain in the areas of: 1) mine design under deep cover, bump prone conditions, 2) support design for rib control, and 3) engineering design criteria for intrinsic and standing roof support systems. Dynamic loading events remain a particularly difficult challenge in deep mining conditions both in coal and metal mining. Finally, recent fatalities in surface mining have been related to spoil pile and embankment stability issues and the Foundation would welcome ideas to address this problem.

Research areas of interest include:

- The control, monitoring and reinforcement of mine ribs, particularly in high stress conditions, and development of an engineered design tool for rib control in general.
- Improved numerical models of ground behavior, with a particular emphasis on the incorporation of exploration and/or monitoring data into the model, and improved capability to simulate post failure ground response.
- Instrumentation studies to assess ground behavior characteristics, pillar loading, and support response that can be used to enhance applied ground control engineering practices.
- The design, monitoring, and reinforcement of mine slopes such as highwalls, pit walls, and waste embankments/impoundments.
- Development and performance assessment of energy absorption roof and rib support systems, particularly for seismically active mining conditions.

Safety of Automated and Mechanized Equipment: Safety improvements are integrated into mining equipment at greater levels than ever before, but stationary and mobile equipment accidents continue to plague both coal as well as metal/non-metal mining and include underground and surface mining operations.

Topical areas of interest include:

- Improved proximity detection and collision avoidance systems, including expanded application on more equipment such as scoops, shuttle cars, LHDs and belt conveyors.

- Develop mining equipment automation that can produce the biggest impact on accident reduction. For example, high incident rate activities such as roof bolting should be examined for automation potential.
- Utilization of cognitive engineering practices to improving the interface between people and their jobs, equipment and tools.

Comprehensive Mine Design: Safe and healthy mine operation depends heavily on integrated components performing effectively together. Modern mine design needs to address rescue and response considerations to mine emergencies as well as designs that attend to preventing risks to miner safety and health.

The goal of this focus area is to conduct studies that take a more holistic approach to mine design, including:

- Investigate ways to optimize mine layout and pillar design for ventilation requirements and explosion potential of sealed areas.
- Evaluate preplanning for mine emergency response through implementation of optimal in-mine layout configurations for communication and tracking deployment and survivability, as well as using surface boreholes at selected locations to provide a well-planned communication network for post disaster response.
- Investigate primary and secondary escapeway positioning in terms of survivability and redundancy compared to optimal layout for shared refuge and escape resources.
- Mine design and intervention measures that mitigate mining-induced seismicity that can lead to regional and local unstable ground conditions.

***Disaster Prevention and Response*:** The primary focus of mining research since the formation of the U.S. Bureau of Mines over 100 years ago has been disaster prevention and response. With the recent string of major disasters that have occurred within the past decade culminating with the most recent Upper Big Branch disaster, this call to duty for disaster prevention and response has never been more critical.

Four focus areas are targeted for research funding opportunities:

Emergency Response: The MINER Act mandated the incorporation of Emergency Response Plans into mine emergency response planning. This has laid the foundation for a more cohesive framework for conducting mine emergence response.

To build upon this framework, the Foundation is seeking research proposals to address the following:

- Strategies/technologies to facilitate mine rescue from the inside-out instead of outside-in philosophy, by having predisposed systems activated at critical locations within the mine post event.

- Study of the design challenges for pre-planned, in-mine safe havens as well as improved refuge chambers for trapped miners.
- Evaluation of optimal energy source and frequencies for seismic-based, trapped miner technologies.

Communications, Tracking and Data Integration: Communications and tracking systems have been enhanced significantly since their introduction through the MINER Act mandate. Both primary and secondary systems are now functional in most mines throughout the industry. However, some challenges remain in order to make these systems integrated and fully functional post disaster.

Priority areas include:

- Determination of survivability thresholds and assessment metrics for communication and tracking systems, and development and testing of hardening concepts for improving their survivability.
- Assessment of the coverage capability, the quality of service and the accuracy of current communication and tracking technologies.
- Evaluation of signal path transmission loss and noise interference in communication technologies, particularly secondary systems such as through-the-earth communication devices.

Atmospheric Monitoring: The communication and tracking infrastructure has provided the mining industry, for the first time in its long history, a robust backbone to operate a complete, wireless, mine-wide monitoring system. Additional research is needed to examine remaining limitations of this backbone, develop subsystems, and define deployment strategies and operational requirements.

Focus areas for research include:

- Demonstration and evaluation of electrically-passive technologies, including tube bundle systems, that overcome permissibility and power limitations for environmental monitoring of active coal mine areas.
- Integration of monitoring systems with mine communication infrastructure and technologies, especially in remote areas that are not readily accessible.
- Studies to determine the optimal sensory deployment and strategies to interpret, on a real time basis, and use information to affect intervention and control technologies for both disaster prevention and exposure controls.

Fires and Explosions: Fires and explosions remain the biggest threat to mine safety. Although there has been much legacy research conducted in these areas, recent explosions clearly indicate that more must be done to prevent these catastrophes.

While the root causes of these events can spread over several sectors, research areas of interest include:

- Investigate the feasibility of lightning-induced mine explosions and the mechanism for energy transfer from the ground surface to the mine level.
- Development and/or performance assessment of improved rock dust materials, deployment practices and real-time monitoring that can ensure effective float coal dust dispersion and control.
- Development and/or performance assessment of active or passive barriers for secondary explosion prevention.
- Improved methods of gob degasification and inertization.

Focus Area 2: Health

The health of the mining workforce is impacted by a variety of work-related health effects. Prominent among these is that of respiratory disease, coal workers pneumoconiosis and silicosis, which is prevalent in metal/non-metal mining operations, but is also rising in coal miner populations. There are a number of less well-studied conditions that are equally important for mineworker health and may account for significant preventable disease. These include conditions such as chronic obstructive pulmonary disease, occupational induced and exacerbated asthma, noise-induced hearing loss, whole body and hand-arm vibration, musculoskeletal disorders, cardio-vascular disease, and stress-related conditions.

To date the vast majority of health related studies have been primarily cross-sectional and descriptive in nature. In selected instances such approaches are still necessary. However, to advance the field, future projects should seek to employ study designs and analytical approaches to allow researchers to make causal inference regarding either etiology or intervention effectiveness. Improving the methodological strength and sophistication of studies is a priority. Developing and assessing feasibility of both exposure and health surveillance is a special need.

Research projects should include inferential and rigorous research methods that can produce findings that can be applied to practical decisions that need to be made by occupational health practitioners, funders and policy-makers.

Special consideration will be given to research projects that:

- Include study designs, sampling frame, and analytic strategies that are externally valid (i.e., representative and generalizable) and address change over time.
- Determine study *power a priori*.
- Use systems methods and multilevel models that account for data that are longitudinal, nested or models that address other non-independent relationships.
- Include a mix of quantitative and qualitative data collection methods; and/or
- Test the validity and reliability of newly developed instruments or validate existing instruments applied to the mining work population.

With this background, the Foundation is requesting research proposals in the following areas:

Hearing loss and other health impacts of noise exposures: The importance of chronic exposure to noise in mining needs better assessment as an ameliorative risk both alone or in combination with other exposures (ototoxins).

Priorities include:

- Hearing loss and noise levels from current mining equipment.
- Translation of advanced hearing protective research and devices into mining applications.
- Development and use of protective devices that are acceptable to miners and do not interfere with safety.

Ergonomic-related conditions: Mining is among industries with the highest exposures to both biomechanical and organizational risk factors associated with musculoskeletal disorders (MSDs). Mining is also associated with significant exposure to whole body and hand/arm vibration. The long-term health effects of these exposures are poorly understood especially in an aging workforce.

Priorities research areas include:

- Analyses of MSD prevalence among mine workers with consideration of mining technology, mine size, mine type as well as miner age.
- Assessment of risk/causal factors (biomechanical, vibration, organizational) for MSDs in mining with particular attention to low back and knee disorders.
- Exploration of selective ergonomic and tool interventions associated with the variety of modern mining equipment.
- Study of the combined effects on the musculoskeletal system of miners, for example, irregular, heavy work and sedentary work such as operating machinery.
- Examination among miners of shift type and length, fatigue, mental overload and underload, intermittent heavy physical work, reduced task variation, sedentary work in fixed postures and whole-body vibration.

***Cardiovascular disease (CVD)*:** Studies from Scandinavia, Germany, South Africa show increased death from CVD in miners. Multiple risk factors (personal & occupational) are related to CVD. Among the occupational factors of interest for miners are exposures to particulates, chemicals and work-related stress.

Areas of interest include:

- Better epidemiologic data on rates of and risk factors for cardiovascular diseases in US miners.
- Assessment of CVD risk in miners with respect to monitoring for relevant hazards (noise, vibration, heat, fine particulates, shift work).

- Assessment and integration of both personal and occupational risk factors in etiologic studies of CVD in miners.
- Study of effectiveness of integrated workplace health promotion and hazard reduction in improving miners' health.
- Exploration of biomarkers practical for use in active miners – role of inflammatory markers of CVD risk for targeted intervention and prevention.

***Surveillance of health conditions in miners*:** Surveillance of CWP in coal miners is advanced in comparison to examination of prevalence and trends in other health conditions that are or could be associated with mining. Surveillance targets and methods need to be more robust.

Priorities include:

- Document optimally effective approaches to health surveillance for the mining population and assess barriers to miner participation.
- Develop and evaluate risk stratification methods in mining to better target intervention and compliance activity. For example, injury/illness/fatality (high vs low), compliance history, age of mines, climate, geographic location, unionization.
- Evaluate existing and develop improved medical monitoring protocols for miners exposed to respirable crystalline silica and other exposures in sand and gravel operations.

Respiratory disease: It is important to better understand the increased lung diseases observed in miners in addition to silicosis and CWP.

Priorities include:

- Chronic obstructive pulmonary disease (COPD) - the 4th leading cause of death in the US.
- Occupational induced and exacerbated asthma in mining operations - an important source of adult onset asthma as well as an important cause of asthma morbidity.
- Respiratory toxicants in 21st century mining – exposures in metal and non-metal mining are not yet well characterized.
- Assess markers of health effects in relationship to measured exposures, such as biomarkers, lung function, and radiographic changes that are relevant to miners and mine environments.
- New epidemics – better understanding of reasons behind new epidemics of CWP in Appalachian mines as well as better characterization of differences in risk by region and in small mines.
- Surface mining exposures – e.g., dust and silica surface coal mining (responsible for 1.2% of PMF and 4% of CWP in 2010/11).

***Injury and illness prevention programs*:** Although there is evidence that safety and health management may improve prevention of work-related injuries and illness and reduce workers compensation costs, the determinants of adoption of effective programs, their sustainability, and their penetration into the mining industry is unknown.

Research priorities include:

- Research on the minimum set of key elements (e.g., management leadership, worker participation, hazard identification, hazard prevention and control, education and training, program evaluation and improvement, etc.) that are appropriate to the mining environment.
- Examination of program alternatives appropriate for different types of mines, sizes of mines and different geographic locations.
- Methods development for assessment of effectiveness of safety and health programs (including development of appropriate metrics) and validation of those methods through evaluation of programs already in operation in the mining sector.

Focus Area 3: Safety and Health Management

Effective Safety and Health Management Systems (SHMS) promote continuous attention to evaluating and reducing risk and to the adoption of workplace policies, practices, and technologies that support workforce safety, health, and wellbeing. Alternatively, the absence of a functional SHMS can lead to lapses in safe practices and reflects inadequate organizational commitment to both safety and legal compliance.

Increasingly, employers worldwide have integrated occupational safety and health management systems (SHMS) into their broader systems of organizational management. Safety and health is often aligned with consensus standards such as OHSAS 18001 and ANSI-Z10:2012, and includes elements associated with planning, implementation, measurement and continuous improvement, in a systems approach emphasizing feedback and corrective action. SHMS are most effective if they reflect total management commitment and active employee engagement. Elements such as leadership, safety culture, task and general training and retraining, communications, management coordination, and risk management are all linked and contribute to improving safety performance. Measurement and evaluation of safety practices and reporting of progress as well as a commitment to continual improvement is key. Furthermore, workplace policies and practices such as work hours, work scheduling, sick leave, employee engagement in the identification and resolution of problems including unsafe conditions, etc., have been central to injury and illness reduction and safety improvement.

Currently within the mining industry, comprehensive programs for improvement of safety and health have been implemented with significant variability among companies. The characteristics and key attributes of the varying approaches and systems have not been well studied. In order for approaches to improved safety and health management to realize their full potential, an optimal configuration of the elements and their integration within the mining framework must be determined.

The Foundation is seeking research to advance the state-of-the-art in the development and implementation of the elements that comprise effective safety and health management programs, policies, and systems. In particular, areas of interest include:

- Best safety leadership practices and practical tools that can be used by mining companies to build and operationalize a safety and health culture system that will optimize the use of their organizational resources. Implement and evaluate the impact of practices and tools developed and explore systems of making these evaluations transparent.
- Design and validation of a safety culture survey for the mining industry, including assessment of reliability. Evaluation of impact and implementation of health and safety culture, within the current regulatory and compliance-based mining framework.
- Risk management integration and decision making in the mining industry, including a data collection protocol for evaluating a risk-based surveillance program that can be used to assess safety management practices.
- Mine audits and resulting empirical data designed to identify and define existing health and safety management practices and measure correlations between accident rates and existing safety management practices. Evaluate alternative audit tools, the outputs of audits and the resultant actions that are evidence-based.
- Analytical and statistical models for evaluation of the interactive effects of safety and health management elements. Quantitative examination and measurement of the impact of specific influences.
- Assessment of individual, organizational, and systems variables and intervention strategies as well as evaluate these in practice for discrete mining operations.
- Roles of leading and lagging safety and health indicators in a safety and health management system.
- Effectiveness of piecemeal vs comprehensive program evaluation.
- Relevance to the mining industry of best practices that have been demonstrated to be effective in other settings.

Focus Area 4: Training

One key element in a comprehensive approach to improving mining safety and health is appropriately designed and delivered training for miners. The industry has a long history of training its workforce to carry out the basic mining tasks as well as to understand the risks and the role of individuals in preventing those risks. An important aspect of this training has also been directed at training to respond in emergencies when preventive actions fail. This was recognized most explicitly in the MINER Act of 2006 that followed three high media profile disasters starting with the Sago Mine disaster in January of that year. The development of training for mineworkers in relation to disasters and to their prevention remains a high priority today. Effective training is also important concerning work practices that reduce or eliminate the different safety and health risks associated with day-to-day underground or surface mining.

Effective training of any population depends on adherence to a number of principles and components that depend upon: 1) Specifying the objectives of the training; 2) Determining the skills and knowledge to be learned; 3) Understanding how people with different backgrounds and experience learn; 4) Accounting for how long people retain knowledge effectively without refreshers; 5) Recognizing how much can be taught in a single session without overwhelming learning capacities; 6) Proper balance of learning needs addressed through classroom teaching and hands-on learning; and 7) Ongoing assessment of learning and competency.

Some elements of these principles are independent of teaching technology while others may be enhanced with new and evolving technologies. Regardless of training program quality, attention must also be directed to methods and mechanisms to make the programs accessible for target audiences. Methods for delivery of training that are convenient and appropriate are, therefore, important to develop and assess.

Research proposals in mine safety and health training are being sought that:

- Differentiate between training needs of individuals and groups.
- Are designed to train to competency and be able to document success.
- Consider knowledge, skills, abilities and other personal characteristics of targeted trainees.
- Pay appropriate attention to current decision science research appropriate to training objectives.
- Consider technology alternatives, distance learning, and delivery modalities.

Priorities for research and development on training and training technology include:

- **Training Methods**: Examination of educational methods along with assessment methodology for mandated and recommended training.
    - Study of training needs, competency assessment, and exercise design methods to maximize individual and group capacity to escape mine emergencies.
    - Examine effectiveness of Mine Emergency Response Development (MERD) training for mine rescue teams.
    - Determine how best to train and assess the competency of the Responsible Person during the stress of an emergency.
    - Research on methods that enhance learning, for example, collaborative learning groups.
    - Research on training needs and methods that consider new vs. experienced miners and younger vs. older miners.
- **Training Modes**: Research into effective means of presentation:
    - Examine active learning, virtual reality (VR) simulators, and responses to varying attention spans, use of alternative and distance-education modes.

    - Examine forms of varied drill simulations to enhance effectiveness of training.
    - Couple with research into assessing the impact of these educational modes.
- **Reinforcement**: Research into effective methods of reinforcement of training practices.
    - Research into methods of reinforcement and renewal of skills and knowledge for such training accounting for different demographic features of miners.
- **Trainers:** Research on trainer quality and effectiveness.
    - Assessment of training performance (the adequacy of those who are delivering the training) including methods, approaches, check lists that could be useful to mine operators, MSHA, and unions in choosing among potential vendors.
    - Design and assessment of a model state-wide training program.
    - Develop a method for use by MSHA or state mining authorities to "audit" the effectiveness of training that is being delivered that appear on paper to meet the mandatory requirements but might not be substantively effective.

Level of Awards

Approximately $10 million is committed to this solicitation and it is expected that up to 15 qualified projects will be funded this year. Typical projects will be of two-year duration. Although three-year projects may be considered under special circumstances, such projects will require additional justification in the concept paper before they are eligible.

Selection Criteria

Upon submission, concept papers will be divided into appropriate groups based on research focus area and topic. A committee composed of Foundation Directors and staff and external content and methods experts will evaluate and rate all submissions using the criteria listed below. Final selection of the concept papers for which full proposals will be requested will be made by the Foundation Directors based on the concept papers ratings, funding restrictions, and priorities.

- The alignment of the proposed research goals, hypotheses, and problem solution to the mine safety and health goals outlined in this solicitation, and demonstrated impact of the proposed work to resolve a significant mine safety and health issue (30%).
- Rigor of the research technical approach to provide a solution to the proposed problem, including consideration of the risk/reward of the proposed effort and assessment of the likelihood for practical implementation or commercial success. Commitment for authentic collaboration between the Proposer and appropriate stakeholders with demonstrated access to mining entities, if needed to fulfill the prime objectives of the proposed effort (40%).

- Experience and qualifications of the research team and the time commitment of the team participants in relation to the proposed tasks. Consideration will also be given for developing needed capacity within the university or mining industry as a secondary outcome of this effort (15%).
- Realism and efficient use of the proposed budgetary costs to complete all elements of the proposed work (15%).

Performance Assessment and Reporting Requirements

Grantees are expected to meet Foundation requirements for the submission of narrative and financial reports, as well as periodic information needed for overall project performance monitoring and management. Written reports on interim results will be required on a semi-annual basis. Project directors may be asked to participate in periodic meetings and to give progress reports on their grants.

Grantees are encouraged to participate and submit abstracts for publication in trade magazines and/or peer-reviewed venues and give presentations at established conferences or other venues during the grant award period.

Grantees will be required to develop a research brief in the final quarter of the project that details findings, policy or practice implications and recommendations. At the close of each grant, the lead agency will be required to provide a written report on the project and its findings suitable for wide dissemination within the public domain.

Use of Grant Funds

Grant funds may be used for project staff salaries, consultant fees, data collection and analysis, meetings, supplies, project-related travel, and other direct project expenses, including a limited amount of equipment essential to the project. In addition, the approved overhead rate for Foundation supported research is 20% of eligible direct expenditures (details will be provided in the instructions for the full proposal solicitation). In keeping with Foundation policy, grant funds may not be used to support clinical trials of unapproved drugs, to construct or renovate facilities, for lobbying, for political activities, or as a substitute for funds currently being used to support similar activities.

How to Submit a Concept Paper

Application and Submission Process

The grant award is based on a two-stage competitive proposal process: 1) applicants submit a brief concept paper that describes the project and, if invited; 2) selected applicants will then submit a full proposal and line-item budget. Instructions for Full Proposals will be provided with the invitation letter. The Foundation will make the final determination for funding after the review of the Full Proposals.

The first step described in this solicitation is to submit the Concept Paper. Concept Papers must be submitted electronically, in PDF format, to the following email address: AlphaFoundation@Glenmede.com. Specific requirements for Concept Paper submission are described below. These requirements are also posted on the Foundation website (http://www.alpha-foundation.org/callforproposals.html). In fairness to all applicants, late submissions will not be accepted. Questions regarding the submission of the concept papers can be addresses to AlphaFdnQuestions@Glenmede.com.

Significant Dates and Times

- **Concept Papers:** Proposers are responsible for submitting concept papers electronically in PDF format by midnight *eastern standard time*, on **March 15, 2013** to the following email address AlphaFoundation@Glenmede.com. Any Concept Paper, modification, or revision received after the exact time specified for receipt of offers is "late" and will not be considered.
- **Review**: The Foundation is aiming to complete concept paper reviews and inform proposers of their concept paper status within 60 days from the submission date.
- **Subsequent Submission of Full Proposals:** Invited full proposals will be due approximately 40 days after notification by the Foundation. Further description and information will be provided at that stage to successful applicants.

Concept Paper Format

The Concept Paper shall be limited to 10 pages in total length, including the cover page. Papers shall be prepared on standard letter size pages with 1" margins and in Times New Roman 12 point font. Submissions exceeding that page limit will not be evaluated. The submission must include the following elements.

- **Cover Page:** A separate cover page shall be labeled "CONCEPT PAPER for the ALPHA FOUNDATION FOR THE IMPROVEMENT OF MINE SAFETY AND HEALTH," and shall include the proposed title, the name of the qualified academic institution or not-for-profit organization, administrative and technical points of contact with telephone numbers, fax numbers, and email addresses. The Cover Page must be signed by an authorized officer. In addition, you must identify specifically the focus area addressed by this proposal from:
    1. Safety
    2. Health
    3. Safety and Health Management
    4. Training
- **Synopsis of the Technical Approach (not to exceed four pages):** This section should provide sufficient information to identify the research approach that is being proposed and how this approach will be used to solve the issue designated in the problem statement. It shall include a summary description of the objectives, scope of work, and the technical approach relative to the problem statement. Any known or perceived barriers to the implementation of the problem solution due to the

uniqueness of the mining environment or statutory regulations should also be noted.

- **Listing of Second/Third Party Affiliations and Stakeholder Partnerships:** Identify partnership agreements and/or commitments established or needed to accomplish the scope of work. NOTE: The Foundation will not be responsible for obtaining or securing field or laboratory sites or establishing points of contact for proposed studies.
- **Period of Performance and Cost Estimates:** Designate the planned period of performance and schedule of major tasks and associated bottom-line cost estimates. (Note: typical projects will have 2 year durations).
- **Resource Allocation and Personnel Qualifications:** Concise summary of the qualifications of key personnel with the approximate percentage of time to be expended by each person during each performance year.

Disclaimer

The Foundation is not responsible for the content or correctness of materials supplied in response to its solicitations and generally and specifically disclaims any responsibility for the same. Proposers are expected to appropriately mark each page of their submission that contains proprietary information. The Foundation will exercise reasonable care in protecting proprietary information from unauthorized disclosure.