



For the Improvement of Mine Safety and Health, Inc

P.O. Box 1371, Lenoir City, TN 37771

<http://www.alpha-foundation.org/>

3rd SOLICITATION AND CALL FOR CONCEPT PAPERS (AFC316)

Background

The Alpha Foundation for the Improvement of Mine Safety and Health is a private foundation with the mission to improve mine safety and health through funding research and development projects to qualified academic institutions and other not-for-profit organizations.

This is the third in a series of single investigator solicitations, in which project funding is provided to a qualified entity to conduct research addressing the root causes of disease, injuries, and fatalities in the mining industry and, where possible, to achieve successful implementation of practical solutions derived from the research effort. Thirty-two projects from 22 organizations have been funded to date. Past projects have been 2-3 year efforts with total project funding levels ranging from \$291K to \$798K. Synopses of past projects can be viewed at the Alpha Foundation website at www.alpha-foundation.org.

Approximately \$4 million is committed to this solicitation. It is expected that as many as 8 qualified projects will be funded. Typical projects will be of two-year duration, although longer-term or shorter-term projects may be considered with appropriate justification due to the research effort and scope of the problem area.

Proposed projects must be relevant to the U.S. mining industry. The scope of research opportunity includes all mining sectors including both underground and surface mining. Furthermore, the Foundation seeks to achieve a balanced approach, incorporating a blend of engineering and health science along with behavioral science and training.

A major aim of the Foundation is to support research projects that have practical implications on mine safety and health for workers, operators, and policymakers. For this reason, a particular emphasis is placed on the early translation and rapid dissemination of project findings. Upon completion of the project, grantees will be required to develop a Final Technical Report that conveys the approach, findings and conclusions of the study.

Focus Areas and Priorities

For this solicitation, the Foundation is seeking to fund research that complements the existing research portfolio and addresses gap areas. Emphasis is placed on the Foundation's focus areas and related priorities listed below.

While concept papers in all areas related to mining safety and health are accepted, any submission that does not address the particular priorities below must demonstrate relevance and impact and provide clear justification confirming that the proposed project area has not been adequately addressed by Foundation funding or other research organizations.

1.0 Focus Area - Health and Safety Interventions: The goal is to prevent conditions, circumstances, or events that cause illness, disease, injury or death to mine workers. The emphasis here is on *intervention and intervention effectiveness* embracing the philosophy of prevention by design. A significant portion of present Foundation funding is addressing research in this focus area. As such, the Foundation has targeted the following specific aims as areas of remaining priority. Projects should identify a clear problem statement and propose an outcome or solution if relevant that leads to or provides an intervention.

Priorities:

- 1.1 *Respirable Dust*** - Development of technologies or enhanced methods for eliminating or suppressing the generation of respirable dust, with emphasis on crystalline silica dust and mining of the parent host rock materials, and specific research targeted to addressing control interventions relative to the new MSHA 1.5 mg/m³ respirable coal dust standard.
- 1.2 *Atmospheric Monitoring and Response Measures*** - Integration of atmospheric monitoring and feedback response systems that target areas that are not readily accessible or require monitoring of multiple parameters to assess impending development of dangerous conditions. In particular, it is desired to assess events that may overwhelm the ventilation system such as: gas outbursts, roof or floor fracturing, gob out-gassing, spontaneous combustion, or excessive float dust deposits.

1.3 Time Dependent Failure Studies - Time dependent failure assessment of ground instability embracing both pillar failure and roof span degradation across all underground mining sectors.

1.4 Roof and Rib Failure Prevention - Measurements of rib deformation and rib bolting performance including anchorage, loading, yielding, and energy absorption during rib dilation; assessing the impact of bolting on controlling rib dilation as opposed to containment of dislodged rib material; and development of enhanced rib bolting design criteria.

1.5 Hardrock Roof Support Injury Prevention - Prevention of roof/strata bolting and Jack Setter injuries, especially in hardrock mining.

2.0 Focus Area - Mine Escape, Rescue, and Training: Mine emergencies encompass a suite of unusual and unique issues that must be managed through specialized training and implementation of advanced monitoring and communication technologies. 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 emergency response. Mine rescue and escape encompasses a wide range of opportunities for research submissions, ranging from technological developments and assessments to decision-making, crisis management, and behavioral studies. Within that context, the Foundation is specifically seeking to address the following areas in this solicitation.

Priorities:

2.1 Communication and Tracking Reliability and Survivability Studies - Experimental design and assessment of the operational survivability of communication and tracking technologies under catastrophic conditions.

2.2 Extending Range of Emergency Response Communications - Innovative approaches to extend or enhance the capability of underground communication technologies, especially through-the-earth or alternative systems that require little if any mine infrastructure.

2.3 Emergency Response Behavioral Studies - Assessment of the behavioral science associated with decision making during an emergency including: a) impact of miner biases and role in decision making; b) miner sensitivity to onset of conditions leading to an emergency; c) impact of reliance on recent technology

developments that may unknowingly lead to exaggerated escape securities; and d) role of loss of working memory during panic situations.

2.4 *Holistic Design for Refuge Alternatives* - Assess the operational and holistic design challenges for built-in-place refuge alternatives and provide engineering or operational improvements that target one or more specific elements.

2.5 *Incident Command and Operations Research* – Identify the weaknesses in incident command and post-event management and application of operations research findings and proven practices from other operations to the mining situation.

3.0 Focus Area - Safety & Health Management and Training: The Foundation recognizes that engineering controls and design interventions alone will not prevent all accidents or the exposure to health risks and disease, and consequently has invested considerable funding in Safety & Health Management Systems and Training. Funded grants have examined and proposed new and enhanced safety and health management systems and training methods. The Foundation is less interested in developing variants of these or other existing approaches, rather the priority is to understand the attributes of what makes the best approaches effective and produce some form of measurable metrics that examine risk stratification or training retention and the correlated impact on miner health and safety.

Priorities:

3.1 *Risk Stratification Studies* - Audits designed to examine existing health and safety management practices and measure correlations between risk stratification and accident rate reductions through targeted interventions.

3.2 *Performance Impact Indicators* - Roles of leading and lagging safety and health indicators in a safety and health management system.

3.3 *Training Retention Studies* - Research into methods of improving reinforcement and renewal of skills and knowledge for safety and health training protocols.

3.4 *Human Behavior Role in Accidents* – Assessment of the degree of human error involved in mining injuries relative to risk assessment and the lack of best practice or administrative or engineering control availability.

4.0 Focus Area - Injury and Disease Exposure and Risk Factors: The health of the mining workforce is impacted by a variety of work-related risks. The Foundation is seeking to identify and evaluate exposures and risk factors that lead to the onset or advancement of injuries and diseases among miners. While causal relationships are the ultimate objective, the Foundation is especially interested in projects having the potential for contributing or leading to an intervention and risk reduction as opposed to studies focused solely on causation without a direct link to near-term intervention potential. Finally, access to data required for the study should be viewed as a prerequisite for the proposal submission.

Priorities:

- 4.1 *Musculoskeletal Disorders*** - Identification of mining jobs and operations with high rates of work related musculoskeletal disorders, including all sectors but particularly in the sand and gravel and aggregate industries, and characterization of the risk factors associated with these disorders; implementation and evaluation of engineering changes or other modifications in job design or work practices to reduce these risks.
- 4.2 *Asthma Disorders*** - Examine the relationships between mine environment exposures and the development or exacerbation of asthma; implement and evaluate opportunities for reducing hazardous exposures that are identified.
- 4.3 *Rock Dusting Health Issues*** - Assessment of the impact of rock dusting and hydrophobic rock dust on respirable dust measurements and the associated impact on health risks to the mine worker.
- 4.4 *Noise Exposure Health Issues*** - Implementation and evaluation of the effectiveness of engineering controls that reduce noise exposure in a variety of mining environments.
- 4.5 *Surveillance and Epidemiology Methods*** - Assessment of the adequacy of existing systems or develop new systems for gathering, preserving, and analyzing the presence and levels of a) leading indicators such as hazards in mining; b) lung function, biomarkers or other early warning signs of health effects and c) the prevalence and incidence of adverse health outcomes among miners.

Eligibility Criteria and Limitations

Concept papers will be accepted only from U.S.-based academic institutions and not-for-profit organizations qualifying as exempt from taxation under the Internal Revenue Code.

In addition:

- Submission is limited to one concept paper per principal investigator and one concept paper as a co-principal investigator.
- Second party funding to for-profit organizations is discouraged and must be limited to equipment purchase or specialized services only. It cannot be used for performing research activities by for profit organizations.
- 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

Specific requirements for the Concept Paper are described below.

Concept Papers must be submitted electronically, in Adobe pdf format, through the Alpha Foundation Grant Management System, which can be accessed at <https://glenmede.smartsimple.com/welcome/alpha>. The submission deadline for this solicitation is 5 pm Eastern Time on **February 1, 2016**. Any Concept Paper, modification, or revision received after the exact time specified is “late” and will not be considered.

Disclaimer Notification: 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.

Questions regarding the submission of the concept papers can be addressed to grants@alpha-foundation.org.

Concept Paper Format and Emphasis

The emphasis for the Concept Paper submission and subsequent review is on the relevance and significance of the research topic and what will be done to achieve the specific aim of the proposed research. The proposer is advised to provide a clear problem statement, proposed solution and convincing evidence that the proposed effort will achieve the research goals.

The following Concept Paper format is required in order to facilitate uniform reviews. All submissions shall include a cover page followed by ***not more than 5 pages*** of documentation (with no smaller than 11-pt font) that address the designated topics. In addition to the 5-page concept paper, a single page documenting biographical sketches of any key personnel can also be included. Note that ***failure to follow the format will result in the concept paper being disqualified.***

COVER PAGE

CONCEPT PAPER for ALPHA FOUNDATION SOLICITATION AFC316

Title: Descriptive title of proposed work.

Submitting Organization: Name and address of organization.

Principal Investigator: Name and contact information (phone and email)

Administrative Contact: Name and contact information (phone and email)

Focus Area: Selected from one of four areas designated in the solicitation.

Estimated Cost: Estimate of total project cost.

Period of Performance: Estimate time required to complete the research (months).

CONCEPT PAPER

Reminder: The concept paper is limited to ***not more than 5 pages*** of documentation (with no smaller than 11-pt font) that address the designated topics. A single page documenting biographical sketches of any key personnel can also be included. ***Failure to follow the format will result in the concept paper being disqualified.***

Problem Statement and Background: Provide a **single statement** of the problem that is being addressed. Follow this with a concise description of the background to the problem including why it exists, the scale of the problem, and why it is important. Identify if the problem area is unique to a specific mining sector or is universal and which areas will receive focus during this particular study.

Focus Area and Relevant Priority: Identify one of the four designated focus areas: 1) Health and Safety Intervention; 2) Mine Escape, Rescue, and Training; 3) Safety & Health Management and Training; or 4) Injury and Disease Exposure and Risk Factors and which priority topic as listed in the solicitation is the most relevant to the proposed research and why.

Note: Any proposed research that does not address the particular priority topics identified in the solicitation must provide clear justification that the proposed area has not been adequately addressed by Foundation funding or other research organizations and the proposed research must demonstrate a high potential impact in terms of mine safety and health. .

Proposed Outcome and Research Objectives: Clearly state the proposed outcome (proposed solution if relevant) to the problem being addressed and the specific research objectives that will be required to achieve this solution.

Research Approach: This is the most important part of the concept paper. Explain the research strategy and plan to resolve barriers that are preventing solution to this problem and why the proposed approach has a high chance for success. Provide a summary of what will be done to execute the research approach and describe what data or information is planned to be acquired to fulfill the project goals and research objectives and whether there are any issues regarding access to this data.

Partnerships: Identify partnerships needed to fulfill the research objectives and whether commitments have been obtained with these essential partners.

Timeline and Costs: Only an estimate of the project cost and time required to complete the project is required and this information can be provided on the Cover Page without further explanation. Note that the approved overhead rate for Foundation supported research is 20% of eligible direct expenditures. If the submitter feels that an explanation is required for whatever reason, then a concise explanation should be provided here. If the concept paper is selected for full proposal submission, then a detailed cost plan and timeline will be required.

For Profit Effort: Identify any for-profit effort and provide a short justification for why it is needed with recognition that only fee for services or equipment purchases is permitted.

Concept Paper Review and Full Proposal Invitation

The concept papers submitted in response to this solicitation will be ranked based on compliance with stated priorities, and *Full Proposals* will be requested based on these rankings, portfolio considerations, and funding availability for this solicitation. Details for full proposal submission will be provided separately to selected applicants and will include specific requirements and timeline for the full proposal submission. It is anticipated that full proposal notifications will occur in April 2016.