

The Alpha Foundation; Improving mine safety through research

by Michael Karmis

In December 2011, the U.S. Attorney's Office for the Southern District of West Virginia, the U.S. Department of Justice, Alpha Natural Resources (ANR) and Alpha Appalachia Holdings entered into a nonprosecution agreement related to the explosion at the Upper Big Branch Mine (UBB) that killed 29 miners. This coal operation was owned by Performance Coal Co., an affiliate of Massey Energy Co., which was acquired by ANR in June 2011, more than a year after the UBB explosion. Pursuant to the agreement, ANR agreed to:

- Establish a trust within 120 days.
- Pay a total of US\$48 million into the trust to be used solely to fund and administer research and development (R&D) projects to improve mine health and safety.
- Administer the trust by three highly qualified individuals with academic and/or professional backgrounds in mine health and safety.

In April 2012, the Alpha Foundation for the Improvement of Mine Safety and Health was created. The three directors — Michael Karmis, president; David Wegman, vice president-treasurer, and Keith Heasley, vice president-secretary — approved a plan to expend both the interest and principal of the trust, aiming at an 8-10 year research horizon. The foundation also appointed David Belden, an experienced manager of nonprofits and professional associations, as the first executive director of the foundation. The IRS approved the foundation's tax-exempt application, as described in Section 501c(3) of the Internal Revenue Code, on Dec. 18, 2012.

The board established guiding principles of the foundation, which are as follows:

- **Mission:** to improve mine health and safety through funding R&D projects to qualified academic institutions and other not-for-profit organizations.
- **Vision:** 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 and undertaken by the best researchers from any discipline that can contribute.

The foundation is now

approaching its third year and regularly posts updates, including semi-annual reports, to its website (www.alpha-foundation.org/), which serves as the main medium for communication with the broader stakeholder community.

Completing the foundation structure and organization

Following a solicitation and evaluation process of nine firms, the foundation selected the Glenmede Trust Co. to be the investment manager of the foundation, as well as provide administrative and operational management services. The foundation also appointed financial auditors and independent outside council firms, with extensive experience of not-for-profit organizations, obtained insurance coverage, developed and approved budget and fiscal reporting processes and designed a distinctive logo for its letterhead and recognition.

During its first year, the foundation retained Thomas Barczak, a recognized international expert in the field of ground control, as its technical director. Barczak recently retired as the director of the Mining Science and Technology Division, Office of Mine Safety and Health Research, at the National Institute of Occupational Safety and Health.

The foundation chose to seek assistance from independent scientific experts as peer reviewers to provide systematic assessment of all funding proposal submissions. The directors, in making final funding decisions, rely on the recommendations of these experts.

Finally, during the last six months, the foundation can report that, after leading the development of instruments necessary for the establishment and functioning of the foundation as a mature entity, David Belden has transitioned to executive director emeritus. The new executive director, Warren Hunt, has served in senior positions with the materials community, including appointment as executive director of The Minerals, Metals & Materials Society.

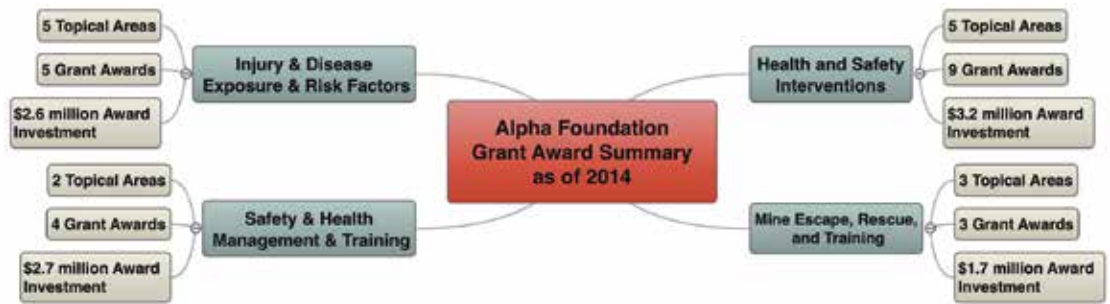
Developing research priorities

An early major initiative of the foundation was to convene a meeting to discuss priorities and issues in mine safety and health research with the broad mining community and to solicit recommendations for attracting participation and projects from outstanding researchers and organizations. The meeting, held in October 2012 in Charleston, WV, was well attended, with 65 organizations and

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Figure 1

Summary of Alpha Foundation grant awards through first two funding cycles.



entities represented and more than 140 attendees. The forum helped facilitate the engagement of the scientific research community and promote involvement by the key stakeholders, the mining industry, government agencies, mine-worker organizations and support companies and vendors, in the discussions. The meeting also provided the first forum to inform the interested public about the foundation, its mission, vision and goals.

Using the feedback from this meeting, the directors developed the research priorities for the first solicitation. The research priority areas were selected to expand the knowledge base of mining safety and health information, address gaps and critical areas and encourage projects that can lead to resolving the complex mining safety and health problems.

Grant solicitations

First solicitation cycle. The directors decided on a two-stage application process for major proposals. Thus, the first call for proposals, released on Jan. 18, 2013, announced a request for concept papers addressing one of the four priority target areas:

- **Safety:** proposals that examine explosions, coal and rock bursts, spontaneous combustion, through the-earth communication, emergency response systems, improved measurement of dust exposure and control.
- **Health:** focus on whole body vibration, diseases of the lung and heart and improved use of existing systems to identify and alleviate adverse health in miners.
- **Safety and health management:** attention to management of risks includes exploration of innovative risk management programs and assessment of effective hazard identification and control.
- **Training:** preparing miners for maximum safety involves research, which considers both evaluation of effectiveness and exploration of new training methods.

The foundation was pleased that 159 concept papers were submitted that addressed all focus areas. The project selection cycle began with the

review of those concept papers by independent review teams, involving about 80 external reviewers, who made recommendations to the directors.

After this review, organizations that submitted the 33 most promising concept papers were invited to submit full proposals. These full proposals were rigorously reviewed — again using external reviewers — and the directors approved 16 projects for funding, totaling about US\$9.5 million.

These funding decisions were made public on Sept. 30, 2013, with an effective starting date of all awarded grants on Nov. 1, 2013. The foundation has been pleased with the depth of innovation and quality of research evident in the proposals. It is important to note the many impressive partnerships between research organizations and mine operating companies that were formed in order to achieve the proposed work.

First short-term solicitation cycle. A solicitation was issued Oct. 24, 2013 to support short-term research projects seeking new, exploratory and developmental research proposals. The response was also encouraging, with the submission of 53 proposals. Projects were first evaluated internally and those judged to be competitive, were submitted for external peer review.

Approximately \$750,000 in short-term research grants was awarded. These projects are just now nearing their completion of first year of effort and are beginning to show signs of innovative advances in science and technology toward research progress in areas where solutions to some of mining's most difficult problems have been elusive.

Second solicitation cycle. A second call for major research proposals, announced May 2014, looked at the same four priority areas but with a sharper focus. The current emphasis is on proposals addressing the following:

- **Health and safety interventions:** Projects that examine coal and rock burst potential, spontaneous combustion, as well as systems of integrated surface mining safety. Interventions under study include improved measurement of dust exposure

and dust control, while innovative solutions are being sought in the rock dust measurement and advanced gas and dust explosion modeling. Advances are also being explored in areas of measurement of roof bolt loading and ground response, as well as early warning forecasting of hazardous conditions through atmospheric monitoring.

- **Injury and disease exposure and risk factors:** For miner health, the foci are on whole body vibration and diseases of the lung and heart. There is also a focus on enhancing the use of surveillance data and health records to identify early risk factors of adverse health in miners to facilitate targeting for advanced preventive or administrative measures.
- **Safety and health management and training:** Attention to management of risks includes exploration of innovative risk management programs and assessment of effective hazard identification and control measures and practices.
- **Mine escape, rescue and training:** Funding is targeting ways to maximize a miner's preparedness to assess emergency situations and respond effectively through improved training methods. Other activities are seeking to make improvements in the design, application and training of recent technological advancements in communication and tracking, as well as sheltering when escape is unattainable.

The foundation was encouraged by the 69 concept papers received. An advisory panel of independent technical content experts within specific topical areas completed the review of these papers and provided recommendations to the Alpha directors. Following this review, full proposal invitations were sent to 26 investigators. Twenty four full proposals were submitted and are currently being peer reviewed.

Accomplishments

An overall summary of the grant awards thus far is shown in Fig. 1. The largest set of awards has been in the health and safety intervention focus area (43 percent), followed by injury and disease exposure and risk factors (24 percent), safety and health management and training (19 percent) and mine escape, rescue and training (14 percent). The funding level is more uniform with the majority of funding (31 percent) in the health and safety intervention focus area.

There is similar funding in the safety and

health management and training areas, and injury and disease exposure and risk factors areas, with funding levels at 27 percent and 25 percent, respectively. The lowest amount of funding has been allotted to the mine escape, rescue and training area (17 percent). Overall, the foundation is pleased that the funding effort is properly aligned with the industry fatality and injury trends and the research priority needs selected by the foundation with guidance from the stakeholders and industry constituents.

Each focus area is divided into topical areas, which represent areas of research priority. The majority of the topical areas have been included for funding. Most of the awards, meanwhile, have been in the topical areas of fire and explosion prevention area, as well as safety and health management, both of which were driving forces behind events leading to the creation of the foundation.

Looking forward

With the solid foundation of a diverse portfolio of projects from the first two grant cycles, as well as the promise of expanding this portfolio through the current cycle, the Alpha Foundation is now looking to the future by evaluating its progress and identifying new areas of research priority.

Recognizing the value of the initial Charleston meeting in gathering input from the mining safety and health community, the foundation is again exploring mechanisms to obtain a current snapshot of needs and opportunities. While the specific methods of engaging the community are under discussion, the foundation anticipates using a combination of surveys, interviews and in-person meetings with a range of stakeholders to inform its next steps.

This input will be vital in developing a long-range plan to guide the next phase of the foundation's work. ■

Acknowledgments

The Alpha Foundation for the Improvement of Mine Safety and Health would like to acknowledge the principals of the agreement who created this foundation for their vision to develop and fund a research programme that can assist miners in the future to be free of work-related injury or disease.

The author would like to acknowledge the Alpha Foundation directors, David Wegman and Keith Heasley, the technical director, Thomas Barczak, David Belden, now executive director emeritus, as well as executive director, Warren Hunt. Finally, the foundation recognizes all researchers who have responded to the solicitations for their interest and commitment to improve mine safety and health.