



for the Improvement of Mine Safety and Health, Inc.

The Alpha Foundation is pleased to present its 2024 Annual Report.

The report provides a summary of activities directed toward the realization of the Foundation's mission to improve mine health and safety through funding research and development projects by qualified academic institutions and other not-for-profit organizations.

Grantmaking Summary

Grant activity is maintained on the Alpha Foundation website (<https://www.alpha-foundation.org>). The following 9 grants completed their research efforts this year.

- AFC820-22 - Miniaturized and Low-Cost Electrochemical Particulate Matter (PM) Sensor for Mine Dust Exposure Assessment (Oakland University)
- AFC820-52 – Large Scale Testing and Modeling of Supported and Unsupported Pillar Analogs (Colorado School of Mines)
- AFC820-54 - Lifting the Veil: Fusing RaDAR and Sound to Provide Enhanced Perception in Obscured Environments (Colorado School of Mines)
- AFC820-59 - Elucidating the individual and combined toxicity of coal mine dust constituents and their contribution to disease in modern US coal miners (University of Illinois, Chicago)
- AFC820-82 - Development of a wireless borehole instrument device to measure 3D rock mass stress and strain change from modifications to a friction rock bolt (University of Utah)
- AFCTG20-106- A Translation Project: How Best to Communicate Epidemiology to Improve Protection of Miners Health (University of California, Berkeley)
- AFCRFP20-111 - Minimizing Rib Failure Hazard: Mapping Tool and Demonstration for Low-Cost, High-Resolution Rib Monitoring (Colorado School of Mines)
- AFCTG22-152- Improvement of Rib Support Design Utilizing Recent Advancements of the Coal Pillar Rib Rating (CPRR) System (Missouri University of Science & Technology)
- AFCTG22R2-157 - Symptoms of Depression, Anxiety and Post-Traumatic Stress among Coal Miners compared to others Occupational Groups in a Population Survey in the Appalachia Region (University of California, San Francisco)

As the Foundation is nearing the end of its grant funding, only 4 new grants began research studies in 2024.

- AFCINV24-4- Analysis of the Spectrum of Coal Mine Dust Lung Disease Throughout the Life of Modern U.S. Coal Miners and the Impact of the COVID-19 Pandemic (University of Illinois, Chicago)
- AFCINV24-8 - Reducing Rib Failure Hazards in Underground Coal Mines by Improvement of the Coal Rib Control System: Integration of Rib Corner, Abutment Loading, and Multiple Seam Interaction (Missouri University of Science & Technology)
- AFCINV24-10 - Automated Sensing Module for Enhancing Miner Safety (University of Kentucky)
- AFCINV24-11 - Evaluation of New Respirable Silica Monitoring Tools for the Aggregates Industry (Virginia Tech)

Since its beginning in 2011, the Alpha Foundation has supported a portfolio of research that comprises 118 projects awarded to 35 institutions totaling 46.8 million dollars. There are 15 active grants in 2024. Overall, the grant portfolio addresses the four major focus areas of the Foundation, with award percentages as indicated:

- Safety and Health Interventions - 56%
- Mine Escape, Rescue & Training - 7%
- Safety & Health Management & Training - 8%
- Injury & Disease Exposure & Risk Factors - 29%

Future Considerations and Planning

All active grants are currently scheduled to complete their research by the end of 2026. In the coming year, the Foundation plans to reexamine our remaining funding and potential closeout costs and begin preparations for legacy reporting of our accomplishments.

Alpha Foundation Board of Directors

Dr. Michael Karmis, Director and President

Dr. Keith Heasley, Director and Secretary

Dr. David Wegman, Director and Treasurer

Alpha Foundation Staff

Dr. Thomas Barczak, Executive and Technical Director

Dr. Michael Silverstein, Technical Associate (Deceased)