Section I: Request

The College of Mines & Earth Science requests approval for the establishment of a center of excellence in mining safety and health management within the Department of Mining Engineering.

Section II: Need

The mining industry in the U.S. remains a socially, economically and politically critical industry despite changing workforce demographics, the growing influence of consolidation by multinational companies and decreasing tolerance of the general public for mining. A wide variety of commodities are produced for domestic consumption and export. The industry’s direct and indirect economic impact is an estimated $1.9 trillion dollars annually (National Mining Association). The industry directly employs 400,000 people with more than 1.5 million in supporting employment.

Accidents and fatalities in the U.S. mining industry have decreased significantly in the last four decades. However, the industry remains among the most hazardous in the country. Furthermore, fatalities, including mine “disasters,” in which five or more people are killed, still occur with alarming regularity, including Upper Big Branch Mine (29 deaths) in 2010, the highly publicized Crandall Canyon incident outside Price, Utah in 2007 (9 deaths), the Darby Mine #1 explosion in 2006 (5 deaths), the Sago mine explosion also in 2006 (12 deaths), the Number Five mine explosion in 2001 that killed 13 and the Wilberg Mine fire in Orangeville (Emery County, Utah) in 1984 (27 deaths). Such disasters are unacceptable by modern social and ethical standards, and more importantly, are unnecessary.

The number of mine disasters outside the U.S. remains disproportionately high, e.g., China. Despite repeated pledges of assurance for improvement against these tragic statistics by national governments, solutions have not been realized.

There is a clear lack of consensus in the industry regarding what is required to produce consistently good safety and health performance and sustainable profitability. However, a growing number of safety and health professionals and companies executives recognize that world-class safety and health performance requires an effectively designed and implemented comprehensive management system, but also requires systematic focus on leadership and culture as critical facilitators of the system. The Center of Mining Safety & Health Excellence (herein referred to as the Center) will be led by an individual with this perspective and experience, as well as practical understanding of the industry.

There is currently a very strong need for a consolidated entity with strong academic competencies, the ability to solve real-world engineering and social-technical problems, conduct foundational and applied research and bring clear analysis and communication skills to the challenges faced by the global mining community.

The University of Utah has had a historic association with the mining industry since the inception of the School of Mines through the State of Utah Constitution and subsequent instruction in 1891. Many of the industry’s leaders and innovators were educated at the University of Utah.

The University’s reputation as a tier one engineering and mining school provide an unparalleled opportunity to establish a Center for Safety and Health Excellence in the mining industry. The establishment of a high-profile, well-funded Center will allow the University of Utah to take the lead in developing, communicating and implementing modern safety and health management systems in the U.S. mining industry, and abroad.
Section III: Institutional Impact

In many ways, the University of Utah and the College of Mines & Earth Sciences are unique in the world for their perquisite mining-related competencies and established patterns of outreach and collaboration with industry. These foundational benefits are expected to accelerate development of the Center's mission. As such, institutional readiness is strong with the exception of physical space. The Center will initially be housed within the distributed space of the College of Mines and Earth Sciences, but will seek dedicated space as its scope and funding expand. This is not expected to occur until 2013.

The Center faculty will initially include the current faculty of the Department of Mining Engineering and be supplemented with adjunct faculty from other academic and government institutions, and senior practitioners from industry. The Center is fortunate to have a cohort of faculty researchers with global reputations for subject matter expertise. See the attached proposed organizational chart for reference.

Staff support for the Center will initially be drawn from the current departmental staff and be expanded as demand and resources permit. Specifically, Ms. Pam Hofmann, will act as administrative manager for the Center. Ms. Hofmann is a 2011 recipient of the Academic Affairs Staff Excellence Award.

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Mike Nelson</td>
<td>Department Chair &amp; Associate Professor</td>
<td>Ore processing &amp; mining techniques</td>
</tr>
<tr>
<td>Dr. Kim McCarter</td>
<td>Professor &amp; McKinnon Endowed Chair</td>
<td>Explosives &amp; mining techniques</td>
</tr>
<tr>
<td>Dr. Felipe Calizada</td>
<td>Associate Professor</td>
<td>Underground ventilation systems</td>
</tr>
<tr>
<td>Dr. Eunhye Kim</td>
<td>Assistant Professor</td>
<td>Rock mechanics &amp; friction initiation</td>
</tr>
<tr>
<td>Mr. Tom Hethmon</td>
<td>Endowed Chair* &amp; Associate Professor</td>
<td>Health &amp; safety management</td>
</tr>
<tr>
<td>Dr. Ilija Miskovic</td>
<td>Assistant Professor</td>
<td>Process control &amp; large system simulation</td>
</tr>
</tbody>
</table>

*Western Mining Presidential Endowed Chair in Mine Safety

The Center will build upon established collaborative relationships within the University of Utah, other academic institutions, governmental agencies and research organizations, non-governmental organizations, and private industry, among others. We believe that one important Center competency will be the ability to leverage multidisciplinary technical problem-solving through collaboration with other University departments and Centers. While many of the problems facing the mining industry are process-specific and related to mining engineering, the prospective Center faculty and staff believe the solutions reach beyond the specific tenets and functions of mining engineering.

Expected University of Utah collaborations include, but will not be limited to: the Rocky Mountain Center for Occupational & Environmental Health (RMCOEH), the Departments of Civil, Mechanical, Electrical and Chemical Engineering, and the School of Business.

External collaboration will include other universities, the National Institute of Occupational Safety and Health (NIOSH), the Mine Safety & Health Administration, state mine safety and health agencies (e.g., Utah Labor Commission), trade associations, and non-governmental organizations, among others.

There is no similar university-based resource currently in the U.S., Canada, Mexico, South America, Africa, the Middle East, Europe, and much of Asia (Australia excepted). As such, we believe the Center will have an immediate impact both domestically, and as resources permit, globally.

Section IV: Finances

The Center will be funded by a combination of private donations (awards, grants, gifts, etc), consulting fees, public funds designated for mine safety research, government grants and awards, and private research grants and fees.
To begin, and in addition to the endowment for the Western Presidential Endowed Chair in Mine Safety, $145,000 in seed funding has been designated by the University. This money is being used to establish the basic functions and organizational structure of the center in advance of more substantial funding to come from outside sources.

In informal discussions, the National Institute of Occupational Safety and Health (NIOSH) has indicated an interest in providing funding for the Center. Meetings are being conducted to discuss this relationship. The amount of this funding has yet to be determined, but is expected to be a minimum of $50,000 to $100,000 per year for two to three years.

Beyond industry funding for the endowed safety chair, there remains a substantial interest in the Center concept within the mining industry and the potential for a material impact on chronically difficult mine safety and health challenges and problems. Thus, there is excellent potential for direct donations from industry to the Center; such donations will be actively solicited. In addition, a full development program is being established to maintain strong relationships with current funding sources and to seek new sources of funding.

The December 2011 announcement of a $209 million settlement between the U.S. Department of Justice and Alpha Natural Resources presents a unique funding opportunity. (Alpha is the Virginia-based coal mining company that acquired Massey Energy Corporation, who experienced the Upper Big Branch (UBB) disaster in April 2010 killing 29 miners). Included in the $209 million is $48 million designated in the settlement for use as follows: “...to fund projects designed to improve mine health and safety. During the two-year period, Alpha will pay a total of $48,000,000 into a trust to be used solely to fund mining safety and health research and development projects by qualified academic institutions, not-for-profit entities, or individuals associated with either of those types of entities designed to improve mine health and safety.” The initial distribution of funds is expected within 120 days of the published agreement between Alpha and the U.S. Department of Justice, i.e., April 2012. It is recognized that the mission of the Center is clearly in line with the type of dispensation envisioned by Alpha and Department of Justice; however, consideration of the Center as a potential donation recipient will be substantially diminished if the Center is not a formal entity within the University and within the same time frame, i.e., May 2012.

While the Center will maintain a nonprofit status, fee-based revenue for Center services is conservatively estimated to be $350,000 by 2013–2014. Annual increase in fee-based revenue is expected to be a minimum rate of 10% after 2014.

Because the Center is being initiated based on the time available through the Endowed Safety Chair, no impact to existing budgets is expected.

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<tbody>
<tr>
<td>Salaries &amp; Wages</td>
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<table>
<thead>
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<th>Revenue</th>
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<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<td>Grants &amp; Contracts</td>
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<tr>
<td>Total Revenue</td>
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<td>$800,000</td>
<td>$1,070,000</td>
<td>$550,000+</td>
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<td>Difference Revenue - Expense</td>
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<td>$414,000</td>
<td>$590,000</td>
<td>$48,400</td>
<td>$85,300</td>
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</table>

¹: Estimated.
Section VI: Center Activities & Services

The Center will develop and build upon existing safety and health-related research in the Department of Mining Engineering. Research will be supplemented with a full suite of educational, consulting and advocacy activities; which will include, but not be limited to:

- Defining and developing a model for world-class safety and health management applicable to all sectors of the mining industry, e.g., surface, underground, and all commodities.
- As part of the model, defining and developing a system for root cause analysis (for mining health and safety) to facilitate the first inter-industry comparison of incident investigation findings.
- Communicating the model through publications (white papers, textbooks, etc.), presentations and seminars.
- Serving as the primary implementation mechanism for the completion of relevant recommendations arising from the Governor’s Utah Mine Safety Commission on the Crandall Canyon Disaster.
- Developing a research program including, but not limited to: basic mine safety science and engineering, and applied safety and health research.
- Publishing non-profit basic and applied research findings through the peer-reviewed literature.
- Developing and delivering graduate and undergraduate curriculum in mine safety and health management through the University of Utah College of Mines and Earth Science.
- In conjunction with the Department of Mining Engineering, developing a graduate degree in mining safety and health management.
- In conjunction with the University of Utah, School of Business, developing a certificate program in mine safety and health leadership for industry managers and executives.
- Developing and delivering safety and health management seminars and short courses for union representatives, mine operators, management, and safety and health professionals.
- Developing pro bono safety and health management seminars and short courses for union representatives, non-profit institutions with an interest in the subject, and small mining companies lacking adequate internal resources.
- Organizing symposia and conferences to advocate for the advancement of mine safety and health excellence and serve as a platform for the dissemination of peer-reviewed and non peer-reviewed mine safety and health research.
- Serving on domestic and international government-sponsored and NGO-sponsored committees and taskforces to advocate for the advancement of mine safety and health excellence.
- Developing a consultancy in mine safety and health management, engineering, toxicology, etc.
- Publishing an annual/biennial state-of-the-industry report on mine safety and health performance and management using University of Utah media services and major U.S. media outlets.
- Serving as a key information source for media outlets regarding mining safety and health.
- As the above activities and services mature, sponsoring a national (potentially international), award in mine safety and health management excellence.
- As the above activities and functions mature, and resources are available to accommodate, providing services to industries outside mining.

Program Schedule

The Center will be launched as soon as it receives formal status from the University. It is expected to be fully operational within the first year, depending on funding.