**SHARPE MEDIA, LLC**
4519 34th St. S.
Arlington, VA 22206-1914
703-379-0652 (o) 914-840-0716 (f)
SharpeMedia@verizon.net / grosharp@msn.com
www.sharpespoint.com

January 11, 2008

Patricia Silvey
Director, Office of Standards, Regulations and Variances
MSHA
1100 Wilson Blvd., Room 2350
Arlington, VA 22209-3939

Re: RIN1219-AB52, Sealing of Abandoned Areas

Dear Pat:

The Corps of Engineers' report on explosive forces at the Sago mine is an important contribution to the rulemaking record on seals in underground coal mines.

The Corps' study, *CFD Study and Structural Analysis of the Sago Mine Accident*, confirms NIOSH's 'worst-case' calculation that overpressures on the Sago seals may have been higher than 600 pounds per square inch (psi). That calculation was included in a NIOSH report used by MSHA as the basis for your emergency temporary standard (ETS) on seals.

Although MSHA adopted two lower reference points for seal strength recommended by NIOSH, you did not incorporate an Institute recommendation that, under certain circumstances, seals should be designed to withstand overpressures of 640 psi. The Agency explained its rationale in the preamble to the ETS as follows:

> Although the recommended maximum seal strength in the 2007 NIOSH Draft Report is 640 psi, MSHA has no empirical or other data, at this time, demonstrating that mine conditions exist that will necessitate seals stronger than 120 psi.

The Agency's position is mystifying, though, because a wealth of empirical data exists from Sago. It is also ironical. The seals rule has been written predominantly to prevent another Sago, where a methane explosion in 2006 in a recently sealed area destroyed 10 seals and killed 12 miners. Yet, if NIOSH and the Corps are right about the strength of the blast, MSHA's regulation will not protect miners against similar explosions. Nor is Sago the first such accident. Pressure was estimated at 1,000 psi in an explosion in an abandoned shaft at the Blacksville No. 1 mine in 1992.

In the ETS, MSHA made no mention of the Corps' report, even though the Agency surely was at least verbally aware of its findings. The ETS was issued last May, the same date as the draft Corps' report.

Its absence from the ETS can be explained by what appears to be a unilateral decision of MSHA's Technical Support Division to put no stock in the Corps' findings. In a memo dated December 2007, Linda F. Zeiler, Acting Director, explained that results from the effort "could not be relied upon for decision-making" because "the critical information necessary to develop an accurate simulation was not available."

The Corps' work was predicated on computer modeling but, Zeiler pointed out, the results were suspect because simulations depended on data that were not known. These data included the concentration and distribution of methane in the sealed area. Yet MSHA had that information. According to the authors of the Corps' report, MSHA told them the sealed area at Sago contained 347,000 cubic feet ($ft^3$) of methane when the explosion occurred, of which about 142,000 $ft^3$ was consumed in the explosion.

MSHA also told Corps' researchers that, based on its detailed survey of Second Left Mains, where the explosion occurred, the methane/air mixture believed to be consumed by the blast was concentrated below the 1408-foot elevation. The volume above that elevation contained a higher concentration of an inert methane/air mixture.

Those assumptions drove the Corps' decision to run a simulation assuming an 8% methane concentration in the lower layer, a percentage determined from methane liberation and ventilation studies following the accident. The results indicated loads on the seals of from 51 to 225 psi. But Zeiler, who called the simulation the most realistic of three that were run, rejected the results, saying "this distribution of methane was a simplification for the modeling and extremely unlikely to occur."

The other two runs assumed 9.5% methane distributed throughout the entire sealed area. Pressures on the Sago seals ranged from 360-1300 psi in run 1 and 156-629 psi in run 2, Corps' investigators reported. Zeiler called the percentage of methane "a worst-case condition, and extremely unlikely to occur." A uniform percentage of methane throughout a sealed area is "virtually impossible," she contended.

NIOSH would disagree. In the NIOSH study, *Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines*, the authors described the belief that methane layering occurs within the still air of a sealed area as a "common misconception," and noted that diffusion processes "will lead to development of a homogeneous methane-air mix within a few days or less."

In light of these data, MSHA needs to rethink its ETS on seal strength; specifically, consider whether or not to require monitoring and inerting in all abandoned areas of underground coal mines universally.

Sincerely,

James Sharpe, CIH
President