

**Comments on Prevention of Major-Hazard Events**  
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Assistant Secretary Main, colleagues, friends, and coal industry stakeholders,

Thank you for allowing me to make a few comments on the *prevention of major-hazard events*. I start by sharing briefly some very relevant statistics on multiple-fatality major-hazard disasters over the last three decades. They will send a *chill down your backs* and highlight where we are today in preventing major-hazard events such as occurred last month at the Upper Big Branch Mine. Afterwards I would like to recite what the National Mining Association-sponsored independent Mine Safety Technology & Training Commission had to say about prevention of such events.

During the period 1981-1990, 90 *underground coal miners perished in seven disasters* involving six explosions and one fire. Although still too many miners died in the next decade, *1991-2000 showed amazing progress* in preventing such disasters as eight miners perished in *a single event* in 1992. With almost another decade complete, during 2001-2010 we have seen *68 miners die from four explosions and a major bump*. From these statistics, we can understand why the public is again *outraged* about the incessant loss of life from such events. Last decade we thought we were on the way to eradicating these events, and this decade shows our *futility* in

doing so. I assure you, as will the Assistant Secretary and nearly all professionals associated with the coal industry, that such *disasters can be prevented*.

In the Mine Safety Technology & Training Commission's report in 2006, we *strongly* addressed what needs to be done to prevent such disasters. In our conclusions, we stated, "The commission *strongly believes* that companies which do not pursue the outlined approaches aimed at fulfilling fundamental safety requirements *should not be permitted to operate underground coal mines*." In our collective minds, and in complete tri-partite consensus, we urged the underground coal industry to *adopt* the approaches we outlined. Our most succinct, relevant closing paragraph noted the following:

In particular in order to move forward safely and productively, the commission believes that a number of broad issues framed by our recommendations deserve serious attention, and should be used to *fundamentally change the management approaches and work practices* taken to fulfill basic safety requirements. First and foremost, *risk-based decision-making* must be emphasized, employed, and improved in all aspects of design, assessment, and management. It is imperative that a risk-assessment-based approach be used, founded on the establishment of a *value-based culture of prevention* that focuses all employees on the prevention of all accidents and injuries. Importantly, every mine should employ a sound risk-analysis process, should conduct a risk analysis, and should *develop a management plan* to address the hazards and related contingencies identified by the analysis;

simple regulatory compliance alone is not sufficient to mitigate significant risks.

It has become painfully evident that there are *lapses* today in doing the work of prevention. Successful prevention work requires a well trained and experienced workforce in the industry, including MSHA, which is *committed* to exercising good judgment, keeping acutely aware of threatening conditions and work situations, and applying painstaking thoroughness in executing daily tasks, *especially the critical tasks that prevent major-hazard threats from being realized*. It also requires commitment of necessary resources (human, fiscal, and physical), timeliness of preventive actions, and *well designed plans* to address prioritized targets to remediate perceived high-risk threats. Addressing threats in a mine is a continuous process, with *every instance requiring utmost attention*. Lapses in identifying the conditions and situations framing any major-hazard threat could lead to realization of another disaster. This targeting approach applies to MSHA as well as mine operators.

There are *signs* in mines that indicate the existence of *elevated risk* associated with a particular threat, for example a potential fire or explosion. Workers and their foremen in the mine are the *first to see them*, things like accumulations of combustible materials, the presence of elevated levels of methane, inadequate ventilation, and bad roof areas. Other signs must be seen by mine examiners, foremen, and managers who oversee the mine; *all should be looking for incipient dangerous conditions* such as inadequate rock dust in areas of the mine, elevated methane levels at or behind seals, accumulations of coal dust in outby areas, non-permissibility of equipment,

etc. *If mine personnel don't address the conditions, then sometimes MSHA inspectors do, but unfortunately, sometimes they don't.*

Clearly at this point, especially in light of the Upper Big Branch Mine disaster, we must feel that the coal industry and MSHA appear powerless in preventing such disasters. But *there is a clear path* for reaching this elusive goal of prevention, and *it is a matter of assessing the level of risk for major-hazard events* through scrutiny by all mine personnel – labor and management – of the major hazard-related conditions that exist or the citations associated with those major hazard-related conditions. If mine personnel *miss the conditions* because of their daily work, then when citations on such major hazard-related standards accumulate to relatively large numbers, and they are deemed *Significant and Substantial* or designated as a *withdrawal order/unwarrantable failure*, then we must take those signs as a *clear signal* that there is *high risk* for a major-hazard event in the mine. To complete the fire triangle in a mine, for example, methane accumulation resulting from inadequate ventilation coupled with a non-permissible condition for a machine located inby the last open crosscut often spells doom. If in addition fine coal dust has accumulated in large nearby areas, then the mine is ripe for a devastatingly potent explosion and mine disaster. I use this example because it is the *recipe for many disasters* that have occurred in the past.

So there is a *straightforward, practical way* to assess excess risk in mines, and data from MSHA can be used to do it. Company private data can be coupled with MSHA data to make the risk assessment even more effective, and be proactive rather than reactive in

addressing high-risk conditions. As you know, being *reactive* always leads to more *chaos, confrontation, and anxiety* than being proactive.

Under Assistant Secretary Main's leadership, MSHA has already begun a process that is targeting the problem of preventing the more prevalent types of fatalities using *Rules to Live By*, and industry through the National Mining Association has virtually endorsed it. This process focuses on cited standards most often associated with the fatalities, which is a means of risk assessment, and it targets work that needs to be done to prevent a similar fatality. Following the Upper Big Branch Mine disaster, MSHA did a *'blitz' of 57 mines* which focused on major hazard-related conditions. In West Virginia, the Coal Mine Health and Safety Board has recommended to Governor Manchin that *special teams* of inspectors be established to *focus on high-risk mines*. These are all steps in the right direction to focus on assessing and managing high-risk conditions. Preferably, mine management will do this work themselves, and never have visits from Federal or state government high-risk-mine teams.

In my own work with a graduate student, published in *Safety Science*, we focused on major hazard-related citations, and particularly elevated ones, to *assess the major-hazard risk* among a pilot sample of 31 underground coal mines. Using the major hazard-related citation measures and coupling them with the prominent, normalized injury measures, a *Safety Performance Index* was formed, using a 0 to 100 scale, with 100 being the best. The mines

in the upper quartile are relatively *low risk mines for major-hazard events* and excessive injury rates, while the mines in the bottom quartile are relatively *high-risk mines*. Each component of the index can be used to *prioritize* work needed to rectify the chronic problems plaguing a high-risk mine.

To cut to the heart of the problem of disasters, certainly work efforts at the mine need to be prioritized, and the best way to do this would be to first *focus on elevated citations* for which there is *no doubt that they are S&S or even worse*. Of course, well managed mines will never get to this point, because they are addressing the high-risk conditions before many elevated citations are issued, they are using a sound risk-analysis process, and they are developing a management plan to address the hazards and related contingencies identified by the analysis. They have also built a culture of prevention and have adopted the principle that simple regulatory compliance alone is not sufficient to mitigate significant risks.

That concludes my comments. Thank you for the opportunity to urge everyone in the underground coal industry to go the next steps toward adopting a culture of prevention in their mines. In my opinion, this is the only way we will ever eliminate disasters.