

# What caused W. Va. mine explosion?

**Culprit could be methane, or it could be coal dust**



A fan is used above Massey Energy's Upper Big Branch Coal Mine on Wednesday to help release gas from the area where miners are believed to be trapped.

Pool / Getty Images

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As Monday's **tragic explosion** in the Upper Big Branch mine in West Virginia shows, the cheap, plentiful coal reserves that supply nearly half of America's electricity needs sometimes come at a terrible price.

In response Hilda Solis, the U.S. Secretary of Labor, promised a full investigation, stating "Miners should never have to sacrifice their lives for their livelihood." But despite extensive legislation and regulation, they do, regularly.

Unfortunately, the people that work in coal mines are too much like soldiers in the military; they willingly risk their lives to perform jobs that are, for better or worse, utterly crucial to our way of life.

The question is: why did the accident happen?

There are two main causes behind deadly explosions. News reports have been citing a "methane" fireball roaring through Upper Big Branch, and that's certainly possible. As swampy plant life is compressed and turns into coal over millions of years, methane is formed. Unable to escape, it sits trapped under pressure in pores

inside the coal. Once miners tunnel into coal seams the gas constantly seeps out of the rock and into mine shafts.

"It was one of the number one problems of mining," Gerald Finfinger of the National Institute for Occupation Safety (NIOSH)'s Office of Mine Safety and Health Research told Discovery News. "In the old days, they would have firebosses who would drape themselves in heavy oilcloth robes, and walk through mines with a stick with fire on the end, to blow off methane in what was hopefully a controlled fashion."

Today, outside air is continuously pumped through a mine to keep methane concentrations below 1 percent. The gas becomes explosive at anywhere between 5 and 15 percent. And **federal law** requires that all lighting and pieces of heavy machinery come with several levels of fail safes to prevent sparks from causing explosions.

But there's no way to be certain methane caused the explosion — coal dust is everywhere in mines, and can ignite violently. Standard safety practice dictates that mines be "rock dusted" so that at least 65 percent of all dust in the mine is made up of harmless limestone.

"If the mine is designed right, ventilated right, monitored right, and rock dusted right, there won't be an explosion," Finfinger said. "Clearly something went wrong."

With 25 miners dead and four still missing, what caused the explosion is far from top priority right now, he added. But reports also have pointed out that Upper Big Branch was cited for 53 safety violations this past March alone.

In 2006 a pair of explosions in separate mines were caused when methane ignited in **sealed off abandoned areas of the Sago** and **Darby** mines, killing 12 and 5 miners in West Virginia and Kentucky, respectively. In each case, the seals were designed to contain methane explosions, but they failed. If a similar cause is found here — still a big "if" — it would be a tragic case of a lesson unlearned.

Forensics teams will spend the next year or so tracing back the pattern of the explosion, looking for flashpoints and sources of sparks. From there, important safety regulations will be examined, and likely updated.