

Outline

Define the Problem

| | | |
|--------------|----------------------------|-----------------------------------|
| What | Problem(s) | Gas blast, miners trapped |
| When | Date | October 16, 2010 |
| | Time | Early morning |
| | Different, unusual, unique | Gas buildup |
| Where | State, city | Yuzhou, China |
| | Facility, site | Coal mine |
| | Task being performed | Drilling hole to release pressure |

Impact to the Goals

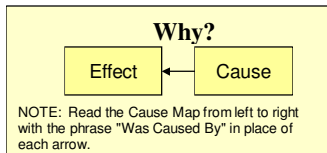
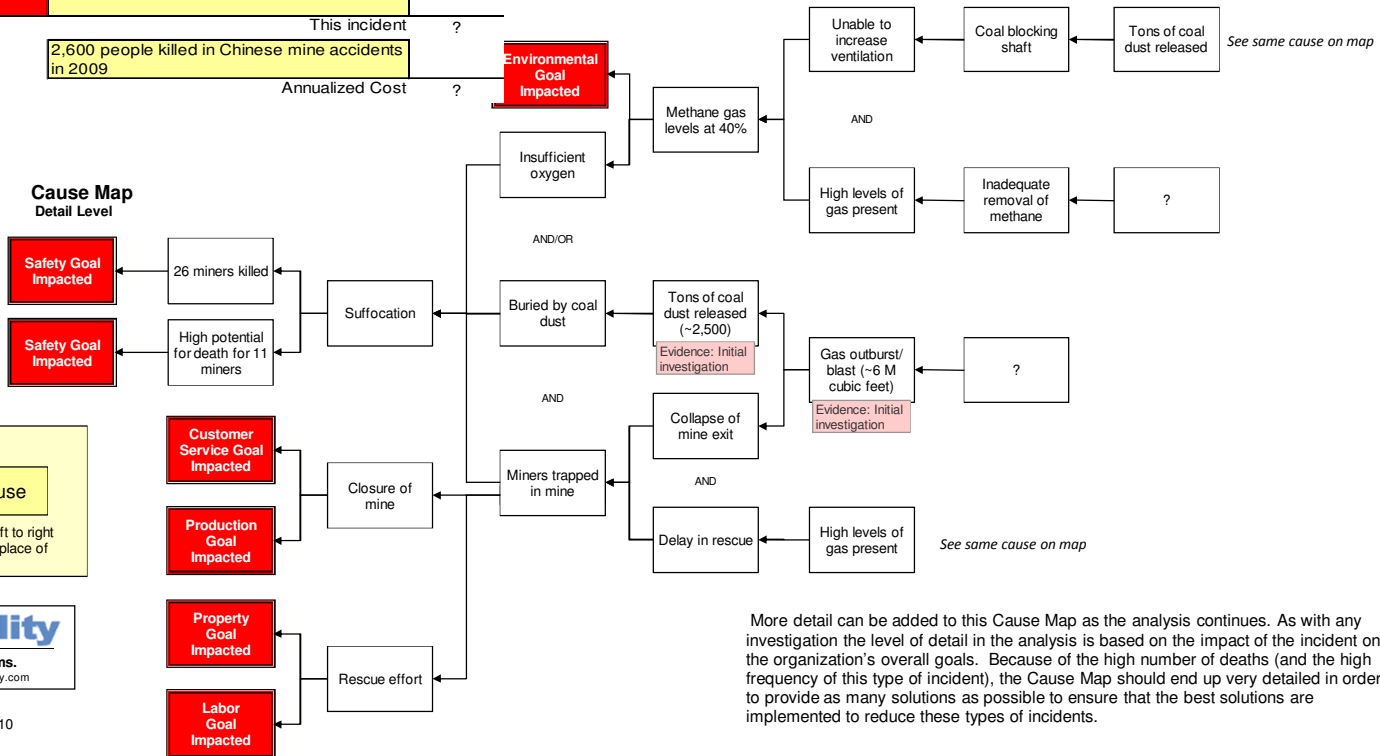
| | | |
|------------------------------|--|---|
| Safety | 26 miners killed | |
| | High potential for death for 11 miners | |
| Environmental | Methane gas level at 40% (normal level 1%) | |
| Cust. Service | Closure of mine | ? |
| Production-Schedule | | |
| Property, Equip, Mtls | Rescue effort | ? |
| Labor, Time | | |

| | | | |
|-----------------|---|---------------|---|
| Frequency | 2,600 people killed in Chinese mine accidents in 2009 | This incident | ? |
| Annualized Cost | | | ? |

Mine Deaths in China

A gas blast in a mine in China on October 16, 2010 in the early morning is known to have killed 26 miners, and the 11 miners unaccounted for are believed dead. In addition to these impacts to the safety goals, the environmental goal is impacted by the extremely high levels of methane gas, the customer service and production goals are impacted by the closure of the mine, and the property and labor goals are impacted by the rescue efforts that have been required. Unfortunately this is not an uncommon occurrence. It is estimated that 2,600 people were killed in Chinese mine accidents last year.

It is expected that the miners were mostly killed due to suffocation. In addition to the lack of oxygen from the extremely high levels of methane (40% compared to the normal level of 1%), the miners were buried by coal dust, released by the gas blast. The miners were trapped in the mine by the gas blast, of which the cause is as of yet unknown. This is a question that additional investigation will try and answer. Additionally more information is needed about the high levels of methane. The rescuers had difficulty reducing the levels of methane because coal dust was blocking an access shaft, but levels were high prior to the blast, for reasons that are unclear.



More detail can be added to this Cause Map as the analysis continues. As with any investigation the level of detail in the analysis is based on the impact of the incident on the organization's overall goals. Because of the high number of deaths (and the high frequency of this type of incident), the Cause Map should end up very detailed in order to provide as many solutions as possible to ensure that the best solutions are implemented to reduce these types of incidents.