

Plant Explosion - Ammonia Release

Booneville, AR

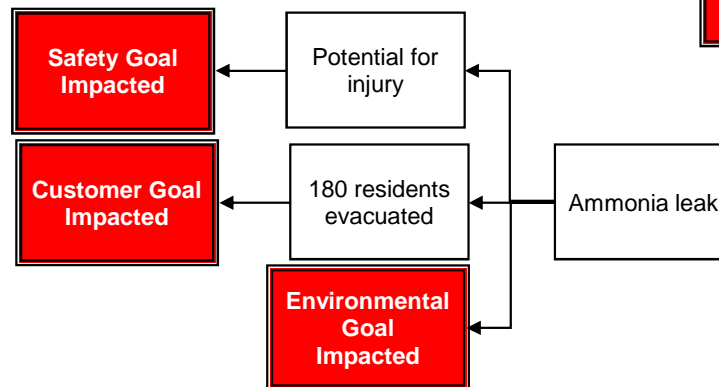
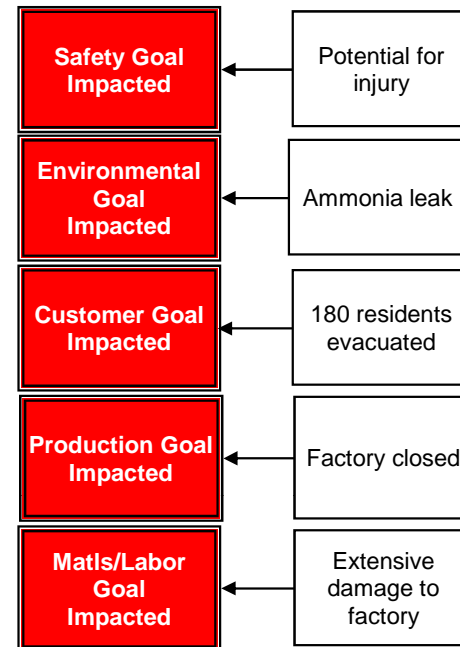
March 23, 2008

The Danger in Hazardous Chemicals: Arkansas Meat Packing Plant Explosion

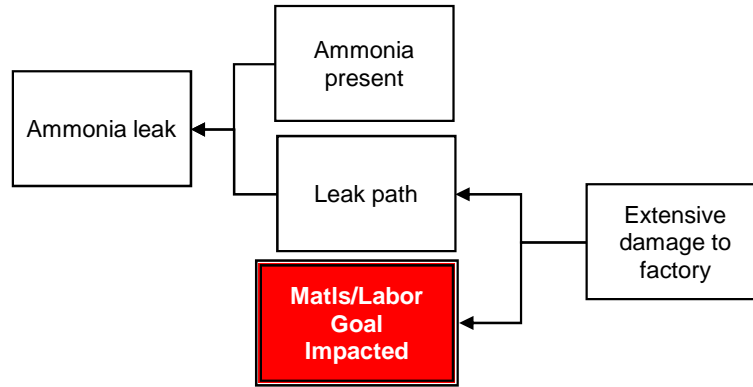
On Sunday morning, March 23rd, 2008, there was an explosion at the Cargill Meat Solutions plant in Booneville, Arkansas. Thankfully no injuries have been reported, but 180 people were evacuated due to the ensuing ammonia leak. Although not much is known about the root causes of the explosion, we can do a very simple analysis.

First, we analyze the impact to the goals. Although there were no injuries, it was probably at least partially due to the fact that there were very few employees present at the plant. So, the potential for injury (had this occurred during a busy working day) has to be taken into consideration as an impact to the safety goals. A leak of any kind is an impact to an environmental goal. An evacuation is an impact to a customer service goal (which I consider to also include community relations).

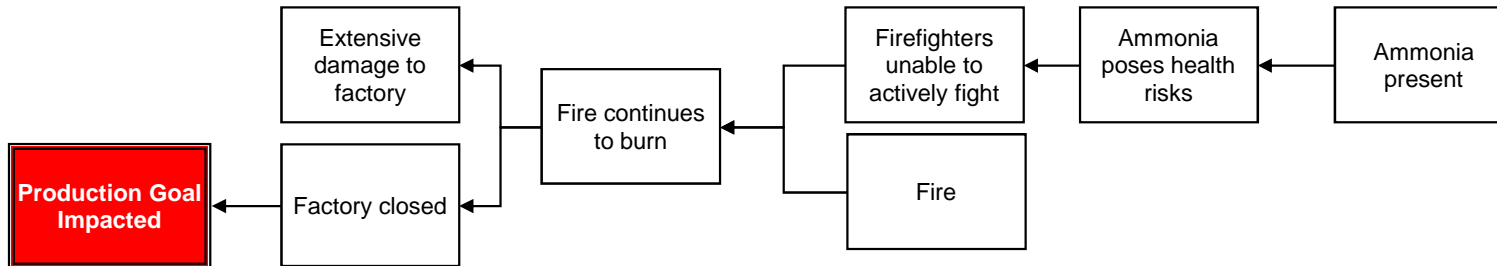
We can begin by tracing some of these causes to the ammonia leak. The evacuation and one cause for potential injuries is the ammonia leak, which itself was an impact to the goals.



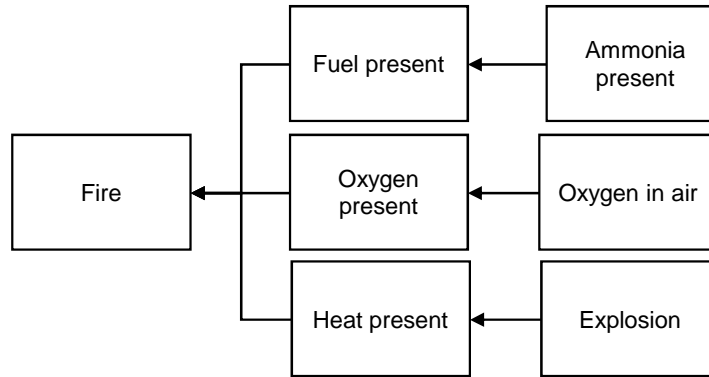
What caused the ammonia leak? Well, for any leak, the thing that is leaking must be present, and it must have a leak path. In this case, the leak path was likely caused by the extensive damage to the building, which is another impact



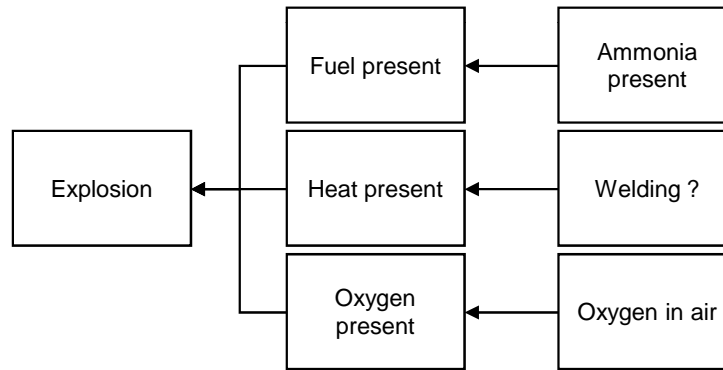
The extensive damage to the factory was caused by a fire that continued to burn. It could not be put out by firefighters because of the presence of ammonia, which poses health risks. Because the fire continues to burn, the factory has been closed, which is another impact to the goals.



In order to have a fire, fuel, heat and oxygen are required. Oxygen is present in the air. Here, the heat was generated by the explosion (which is actually a type of rapidly igniting fire). What fueled the fire is unclear, but it's possible that it was the ammonia.



Because an explosion is a type of fire, it also requires fuel, heat and oxygen. Again, the oxygen is from the air, and the fuel is unclear, but potentially ammonia. What supplied the initial heat to start this disastrous chain reaction is also unclear, but there was welding going on at the time. Thus, it's possible that the



That's about as far as we can go without further information, but if you look closely at all these partial root cause analyses, you'll notice a theme. "Ammonia present" connects to no fewer than four cause boxes, contributing to the explosion, the fire, the lack of firefighting capability and the evacuation. This doesn't mean that the answer is necessarily to stop using ammonia. That may solve the problem, but there are times when hazardous chemicals are necessary to certain processes. However, it does mean that if a single cause shows up frequently in our cause map that extra attention must be paid to it. That is certainly the case with any hazardous chemicals, including ammonia.