Asphalt dust explosion

EPSC Learning Sheet July 2023

What Happened:

During the loading of solid asphaltene into a trailer, a primary dust explosion occurred inside a loading bellow due to a faulty bonding of a bellow support cone. The primary explosion dispersed dust and set up a secondary explosion inside the loading hall.

Aspects:

- Ensure that Dust Hazard Analyses are performed using industry best practices and correct dust characteristics (e.g. minimum ignition energy or temperature).
- When testing the explosion properties, always use the smallest possible dust particle and verify the actual particle size when in operation (verify your DHA risks in the real world).
- Housekeeping is a crucial measure to prevent secondary explosions. Often the first explosion disperses more dust and sets up the more severe secondary explosion.
- Implement adequate and effective protection systems and safeguards against dust explosion.
- Assure correct and reliable bonding and grounding of metal parts. The solid asphaltene fell through the bellow metal support cones into the trailer. The bonding cable of the last cone was not well connected causing an ignition due to static discharge.

Small dust particles of combustible solids can be ignited by a static electrical discharge