

Damage Limiting Construction – Part 3 Deflagration Conduits



Damage Limiting Construction- Part 3. HCI Systems, Inc.

If you are just starting with this article on Damaging Limiting Construction, please go to my LinkedIn page and also read parts 1 and 2. This Part 3 will discuss how deflagrations (i.e., fire ball) can be transmitted from building to building via material handling conveyor structures, dust collector piping and similar type conduits. Conduits, in this context, are not electrical conduits containing wires, but are pathways.

The above photos depict the same conveyor system from 2 different angles. On the left, is the conveyor post-event. We know the fire ball made it to the main building (future article) but notice that most of the siding and roof panels appear intact. Also note that some roof panels that functioned as sky lights are blown away. They seem to act as pressure relief panels. When the fire ball made it to this conveyor, the pressure wave which preceded it shook the structure releasing latent coal dust that had settled on floors and beams and put it airborne. So the fire ball had its fuel to continue up the conveyor to the main building. The sky lights relieved just enough pressure so that the remaining side and roof panels remained intact. This was confirmed by a witness of the event that in their testimony said the propagation of the fire ball up the conveyor took several minutes and as the sky lights failed, there was a distinctive pop. And, when the fireball made it to the main building, "all hell broke loose".

The photo on the right is called a pressure wave break. If you have seen this at other plants, now you know where it all started. The intent here is to dissipate the pressure wave to minimize airborne fuel so that the risk of the fire ball propagating is minimized. The one shown here is approximately 100 FT long.



So the lesson here is to design connecting material handling systems to minimize the risk of deflagration propagation.

Damage Limiting Construction - Part 4 will discuss deflagration conduits as it applies to dust collection systems.

Comments or questions? Please contact me at richgehse@hcisoftware.biz