Areas of Concern for Properly Bonding & Grounding Equipment

- **Bulk Receiving**
  - Bulk trucks, rail cars and tankers should be tied to the plant bonding and grounding system while unloading.
  - A large capacitive charge can build up on any components (truck, hoses, convey line, etc.) that are not bonded and grounded.

- **Flexible Intermediate Bulk Containers (FIBC)/Bulk Bag Handling**

- **Filter Cage Bonding**
  - According to NFPA 77 conductive filter media can be more hazardous than non-conductive media.
    - The purpose of the ground wire(s) in a filter bag is to **bond the cage to the filter housing**. Most installation doesn’t accomplish this and ends up causing a discharge between the ground/bond wire and cage to spark when the filters pulse.
    - Non-grounded, intrinsically safe filter media – no metal allowed in the construction of the media or support cage. Our SideWinder with STS media or DL bag with poly cage meets this requirement.

- **Equipment Joints**
  - **Flange Points**
    - Gaskets insulate connections.
    - Bolts in flanges may not provide a bonding path, especially on painted equipment.
      - Dismantled equipment doesn’t have the bonding path when it’s reassembled slightly differently.
      - If a low MIE material is being handled, or explosive vapors can be present, there should be separate bonding connections tied together with a bonding wire or strap, so it’s visually obvious that the bonding is in place.

- **Flex Connections**
  - Flex connectors should be made from non-conductive material.
  - Separate bonding wire should be run between the two stubs that the flex connector attaches to.
  - Un-bonded flex connections can cause static discharge that will affect scale reading on electronic scaling equipment.
  - High static discharges that bleed back through load cell leads can damage weight indicator instruments.
  - Discharge across unbonded flex connections have been determined to cause dust cloud ignitions.

- **Flex Hoses**
  - Grounding/Bonding wires in hoses are very hazardous if they are not bonded to the conveying line and plant bonding system.
  - Hoses with multiple wires are not recommended because both wires must be tied to the bonding system.
  - Use conductive flex hoses without bonding wires whenever possible.
    - Flex hoses with conductive additives in the rubber/plastic are becoming more common.

- **Sight Glass Convey Line Couplings**
  - Sight glass should have a positive bonding mechanism to the two ends.
    - Horizon Sight Glass provides this with its tie rods.
  - Couplings should have a positive bonding mechanism to bond all metal components in the coupling to each other and the convey line pieces that are being joined together.
    - Compression coupling ground strips can be easily damaged.

- **Poly IBC’s and Metal Discharge Valves**
  - Horizon’s Poly IBC’s used on the I2 system can present a hazard on very low MIE (<20mJ) materials.
  - IBC’s (Rigid or Flexible) in Class I (explosive vapor) areas must have a full process hazard analysis done to determine if they can be safely used and what operational procedures must be followed.
  - The danger is not discharge from the outside wall of the IBC, but from the metal valve at the bottom.
    - Always fill through a bonded/grounded spout.
    - Horizon’s discharge stations have a spring loaded bonding pin that automatically bonds the discharge valve to the station frame when the IBC is docked.