BEST PRACTICE OF THE MONTH

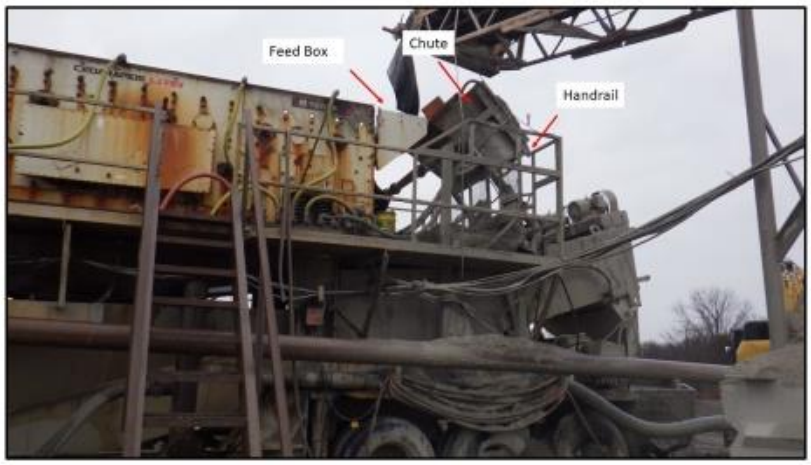
Goodfellow Corporation
Blake Goodfellow

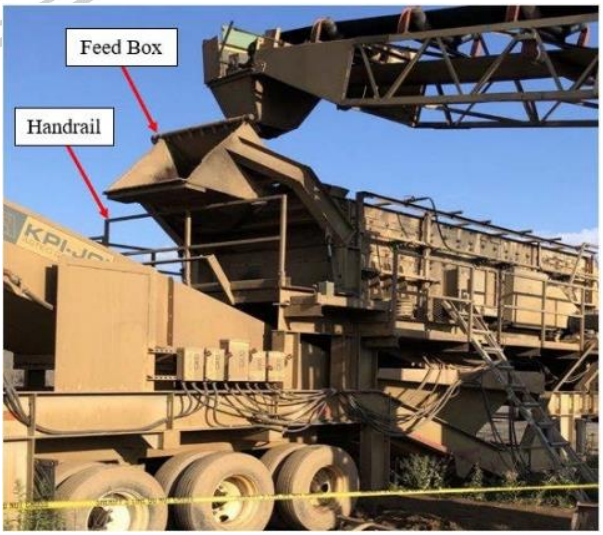
Mechanisms and Hydraulics

- In 2023, the United States saw two fatal incidents (8/24/2023 and 12/14/2023) involving a portable aggregate wash plant. These portable plants typically consist of a feed chute, wash screen (either horizontal or inclined), discharge chutes, and a fine material washer mounted on a wheeled chassis. These plants are very popular in Arizona, and a common site at sand and gravel operations.
- Due to size constraints imposed by portability, the feed chute (which acts to add moisture to the material prior to screening) must be folded down or removed prior to transport.
- In both of the referenced fatalities, the Miners were involved in the operation of folding the feed chute (for transport or maintenance) when they were crushed between the chute and the handrail at the feed end of the screen.
- From photos provided in the MSHA fatality alerts, it can be seen that both chutes were equipped with hydraulic folding mechanisms, although it is unclear whether these were OEM designs or installed later.

Best Practice:

- MSHA Reports detail four best practices to prevent such injuries
  - Block machinery components against motion before beginning maintenance or repairs and verify miners are in a safe location before moving equipment and components.
  - Examine work areas during the shift for hazards that could be created while performing the work.
  - When conducting a non-routine task, review safe procedures before starting work and ensure all safety components are in place.
  - Do not work under suspended loads.
- Additional best practices can also be gleaned from these and similar situations
  - Hydraulic systems should never be utilized for blocking machinery components against movement.
  - When removing bolted connections, consider the forces traveling through the bolt and the consequent reaction once the bolt is removed. Consider gravity, thermal, spring, and other loading factors.
  - Bolts loaded in shear are less prone to careless removal while under load compared to bolts loaded in tension, and equipment manufacturers should consider this in equipment design.
  - Task-training for hydraulic systems should be standard, similar to other lifting equipment (cranes, telehandlers, etc.), and the use of traditional lifting equipment should be considered if operators are better trained with that equipment.





Arizona State Mine Inspector 1700 W. Washington Suite, 403, Phoenix, AZ 85007
Paul D. Marsh pmarsh@asmi.az.gov (602) 542-5335