

Coal-fired Power Industry

Coal Combustion Residues (CCRs) Material Handling Considerations

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Topics

- **Process Considerations for CCR retrofits**
- **Dry Ash - Pneumatic Options**
- **Mechanical Materials Handling**
- **Dewatering options for BOTTOM ASH, FLY ASH, and GYPSUM**

Wet-to-Dry CCRs

Some Process Considerations

BOTTOM ASH

- in situ dewater or off-line / centralized
- combine with other CCR waste streams?

FLY ASH

- total hoppers and locations/clearances/orientations (ECON, APH, ESP, BH)
- dry silo / dome type and location
- truck haulage methods (dry PD trailer for future sales and/or covered haulers for landfill)

GYPSUM

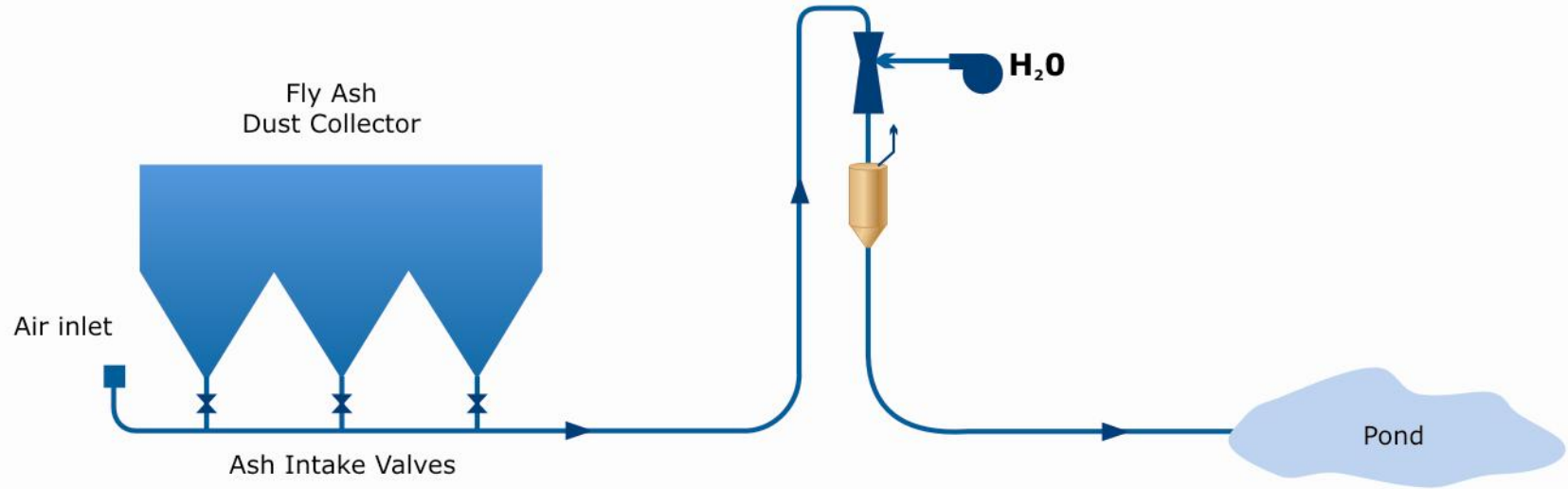
- thickener / filter locations
- reblend with other bulk solid and/or liquid waste streams

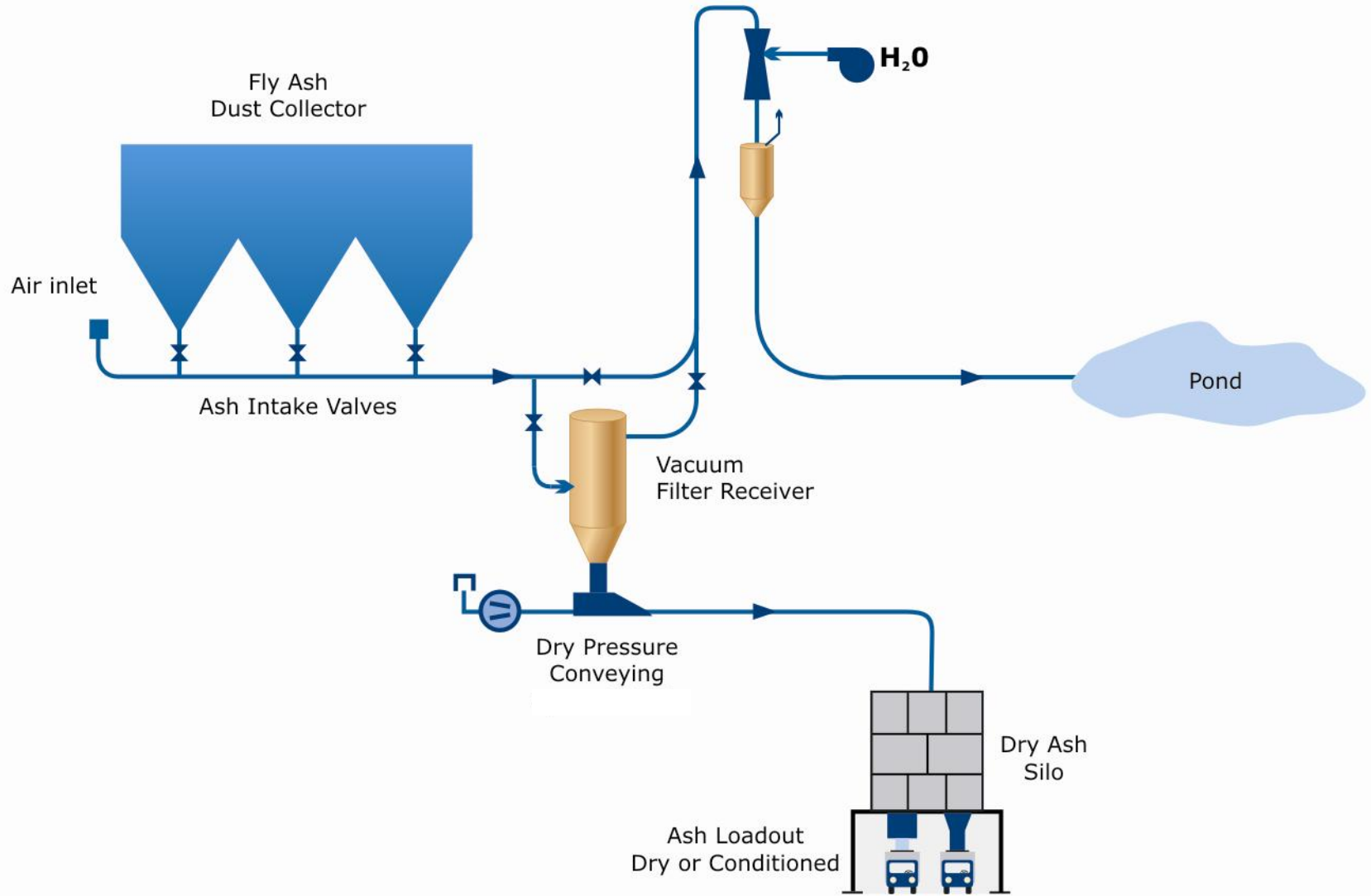
TRANSFER PATH

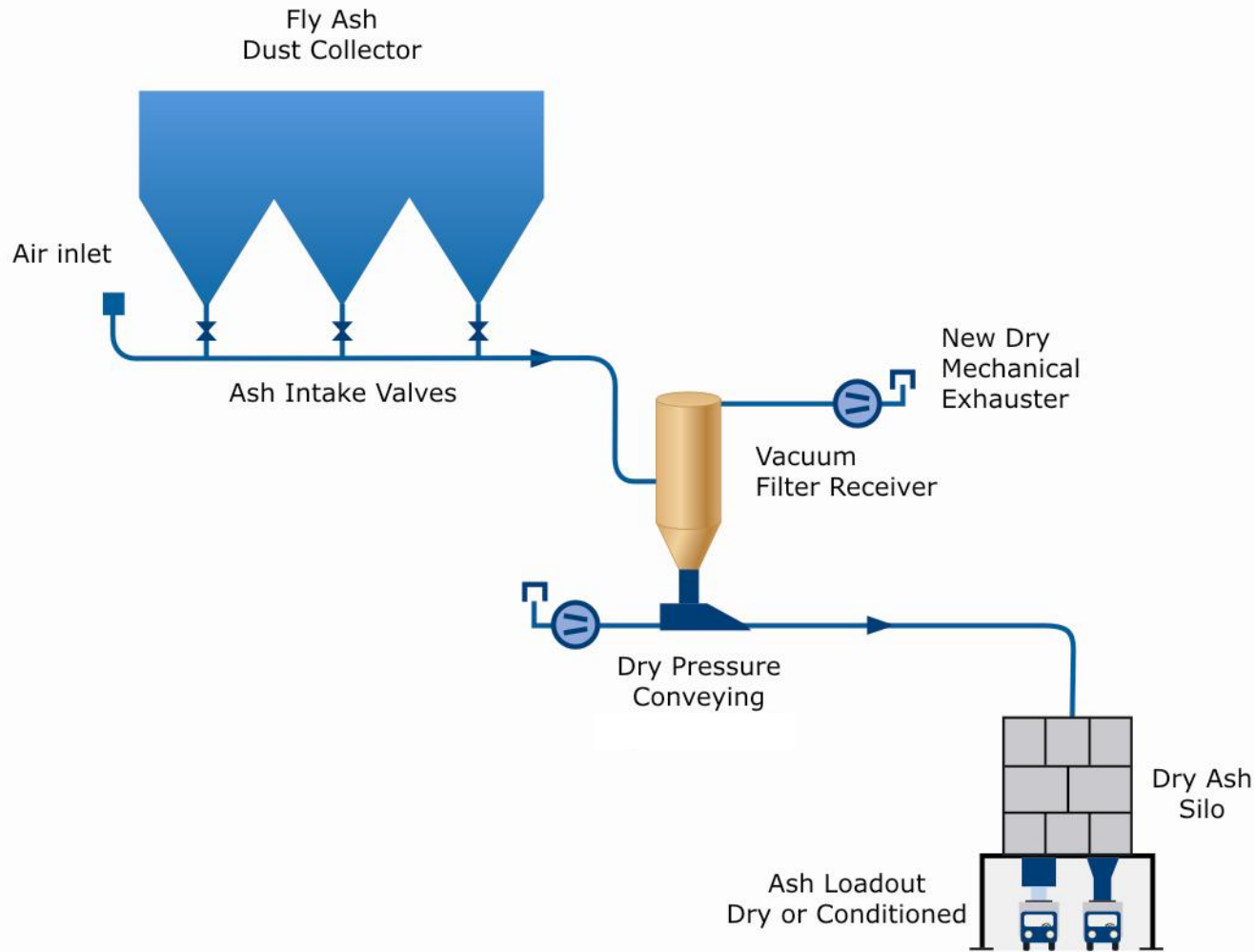
Distance, rate, route → Pneumatic / Mechanical / Slurry/Paste

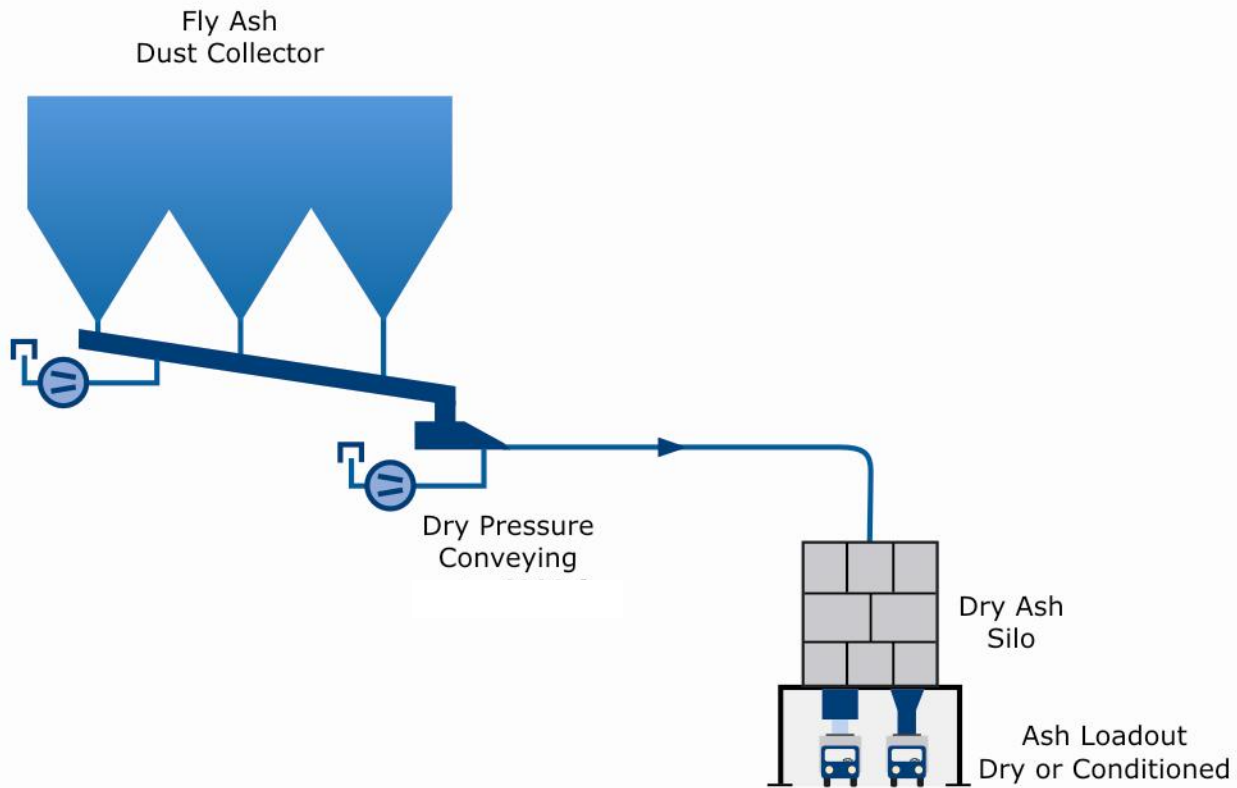
DESTINATION

- storage type (dry silo, dome, conditioned piles)
- coverage
- runoff
- Containment and final placement
- BOP/mechanical: for example, truck scales (local or for commerce)

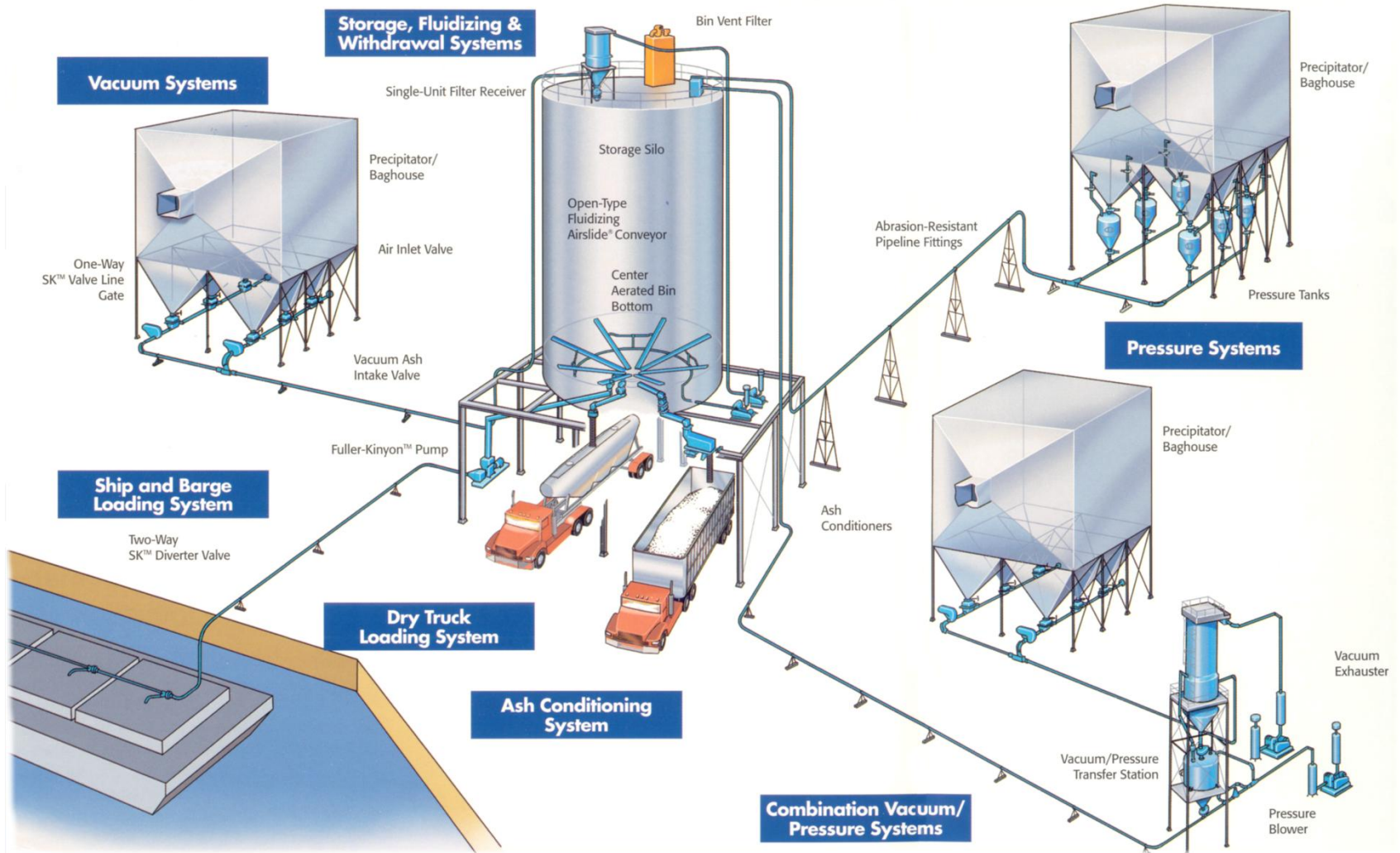








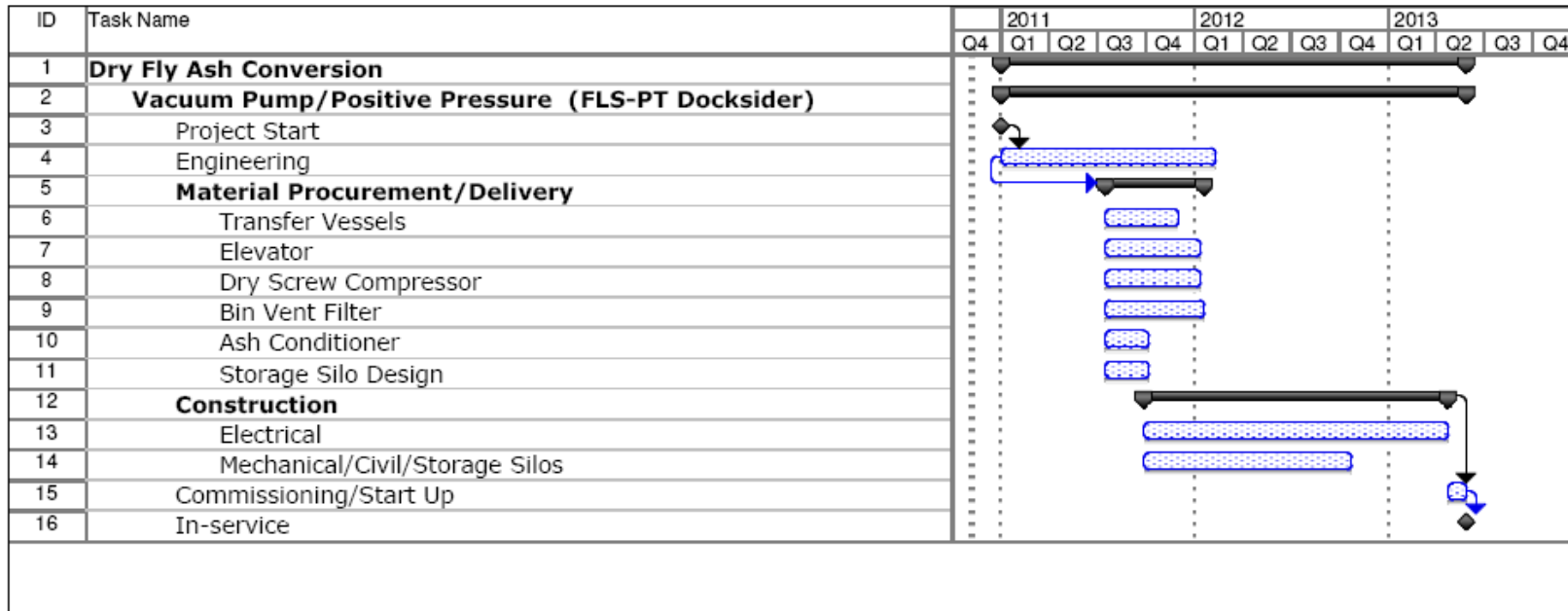
Traditional Fly Ash Handling Systems



Dry pneumatic fly ash options



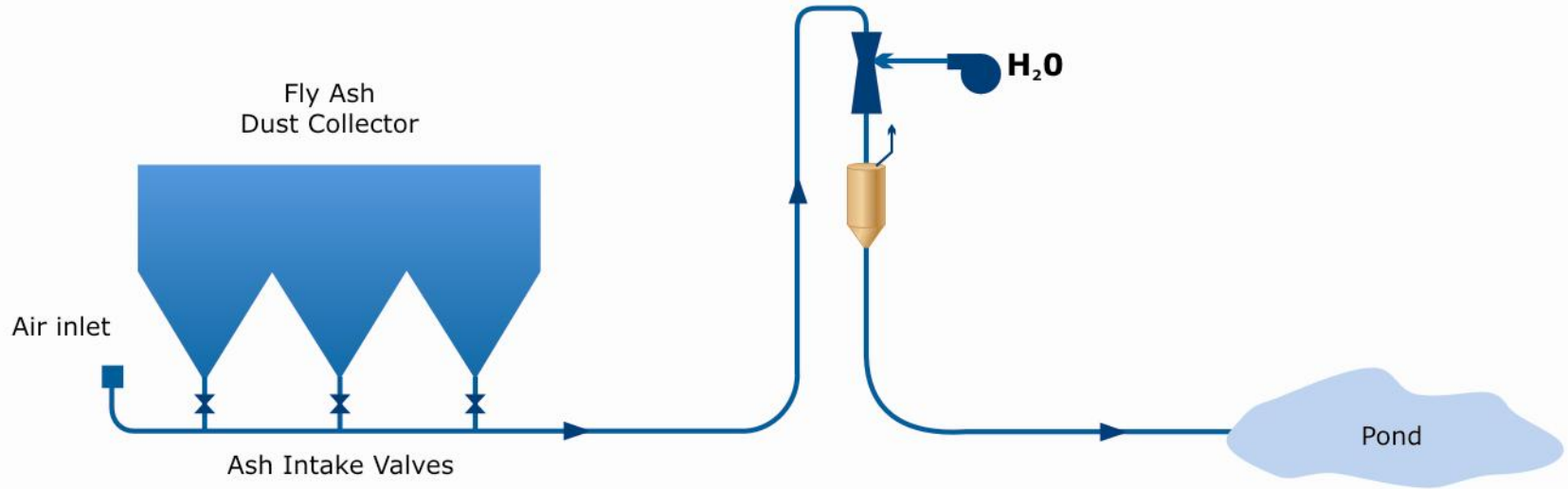
Dry Fly Ash Pneumatic Retrofit Schedule

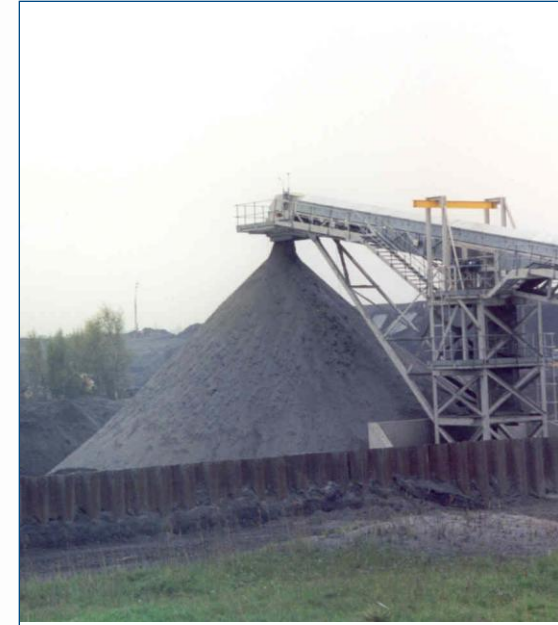
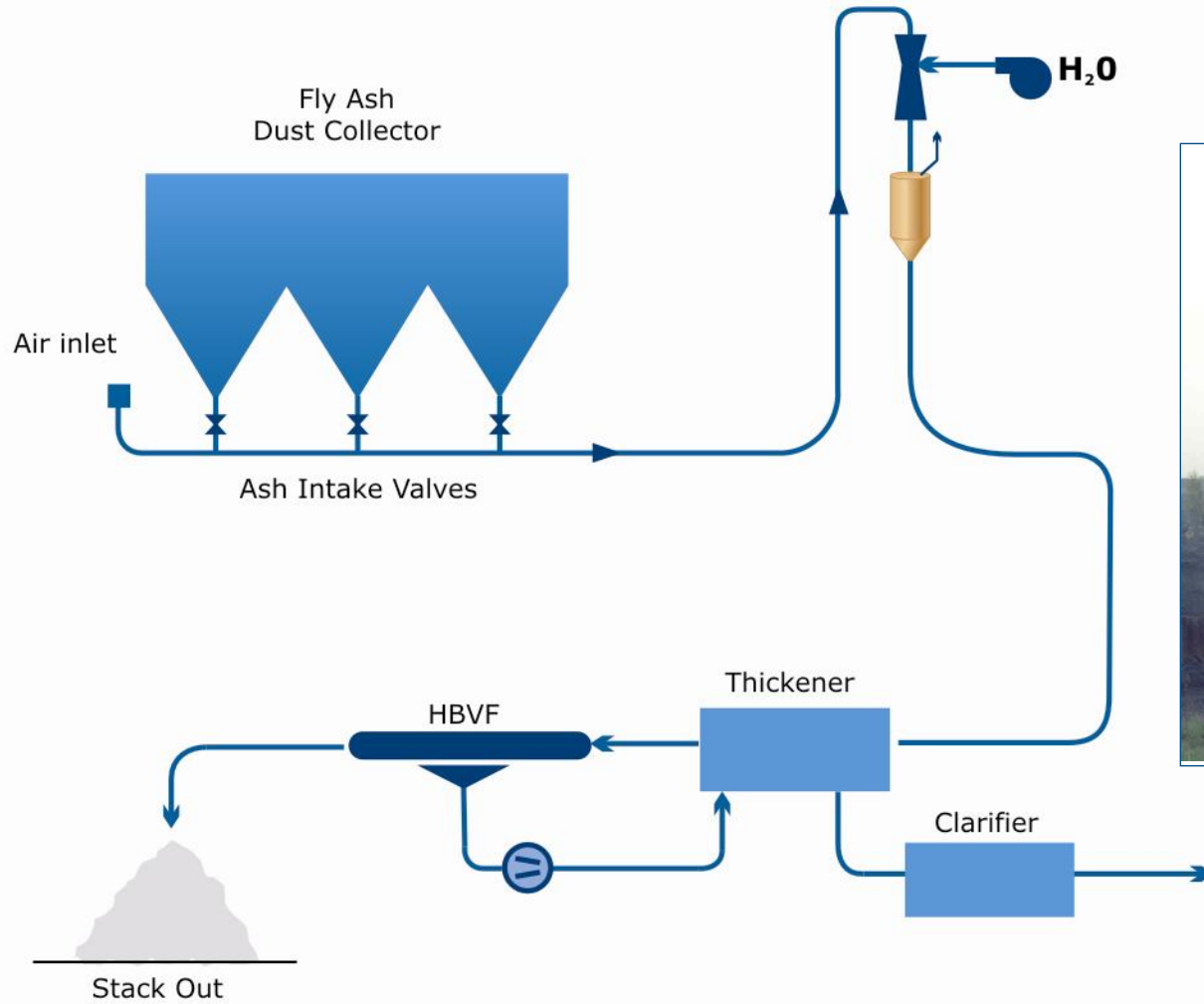


Mechanical Conveying of CCRs

- Long Haul Pipe-Conveyors for bulk solids
- **FLSmidth Wadgassen GmbH (formerly KOCH)** and **Dearborn Mid-West Conveyor Company**
(exclusive US licensee of FLSmidth/Koch technology)



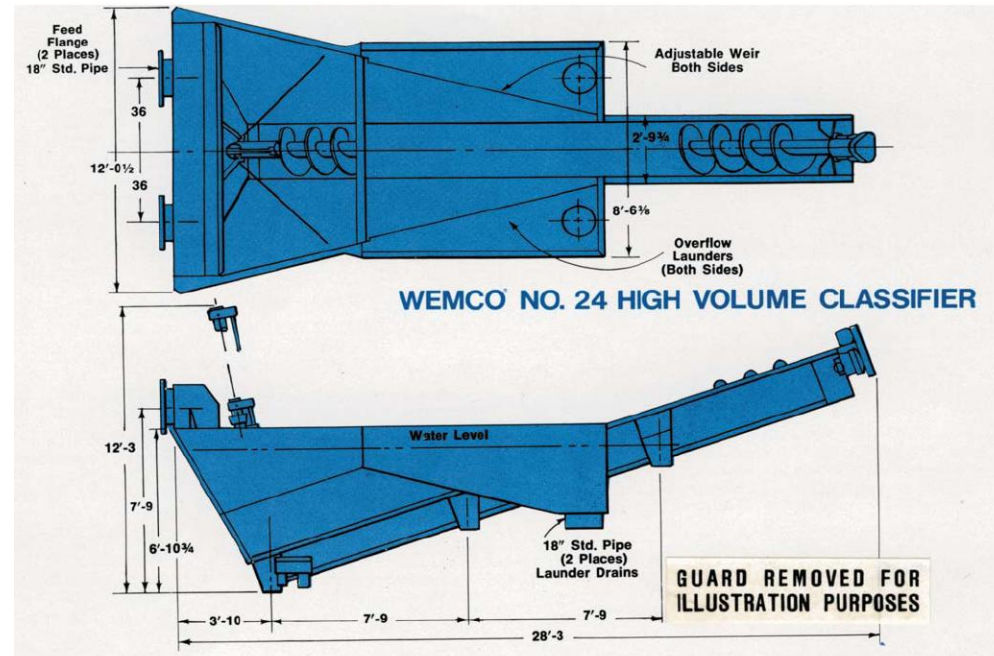




BOTTOM ASH DEWATERING

Ex-situ Bottom Ash dewatering
 FLSmidth offers three (3)
 technologies depending on the
 application.

- The horizontal belt filter when fly ash and bottom ash are mixed together
- High Volume Screw Classifier
- Submerged Chain Conveyor



CLASSIFICATION



Hydrocyclones



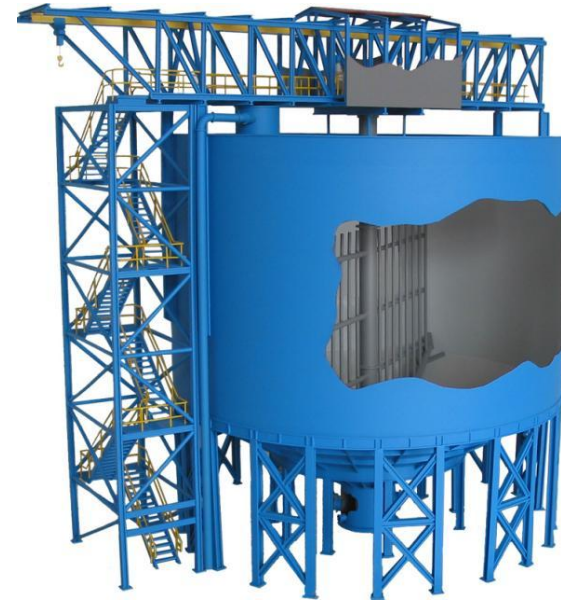
Spiral Classifiers

Vacuum Belt Filter



PASTE TECHNOLOGY

- FLSmidth's **PPSM technology**
- PPL Colstrip Station converted from dilute slurry to paste
- ~70% solids
- Increased capacity of storage volume by 160M ft³
- Increased usable life of storage volume by 10 years
- Liquid seepage went from a concern to "negligible"
 - **Data from Golder Associates.**



CONTACTS:

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THANK YOU

