Wet FGD
Materials of Construction

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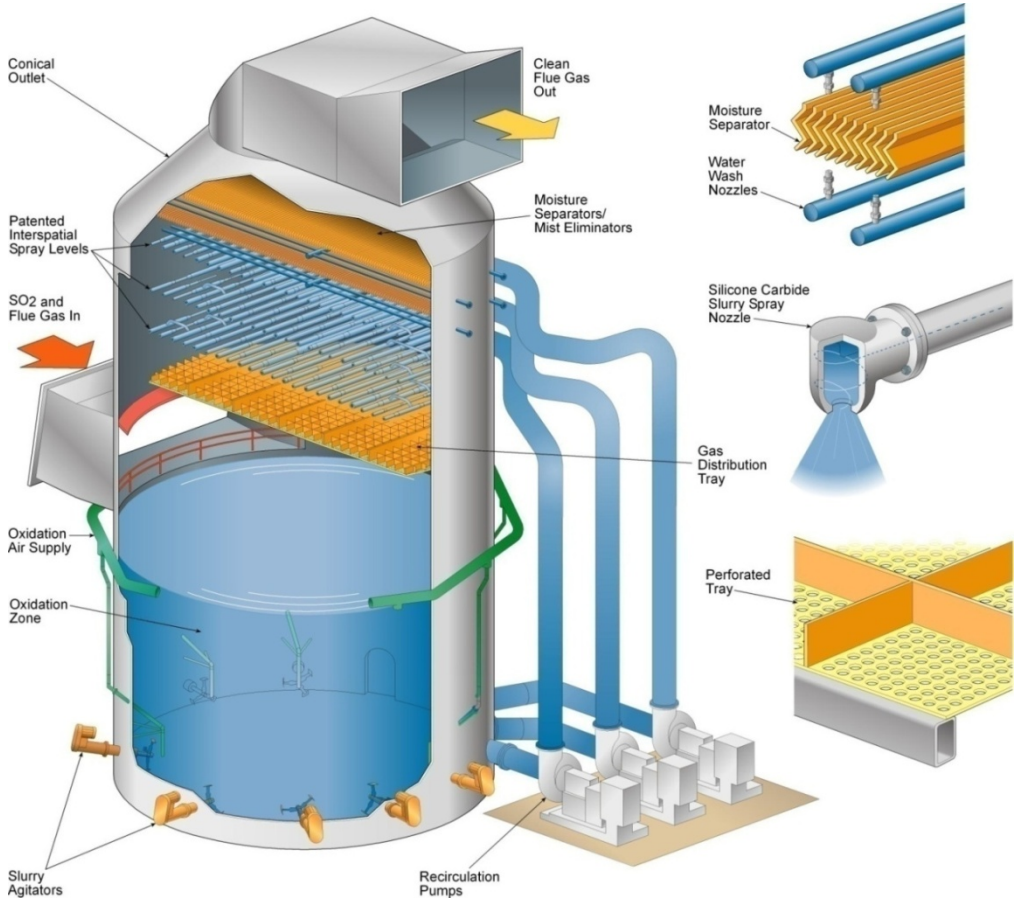
Wet FGD Absorber Zones

- Inlet fluework and dampers
- Inlet wet/dry interface
- Recirculation tank
- Spray zone & spray headers
- Mist eliminator and outlet flues



Inlet Fluework and Dampers

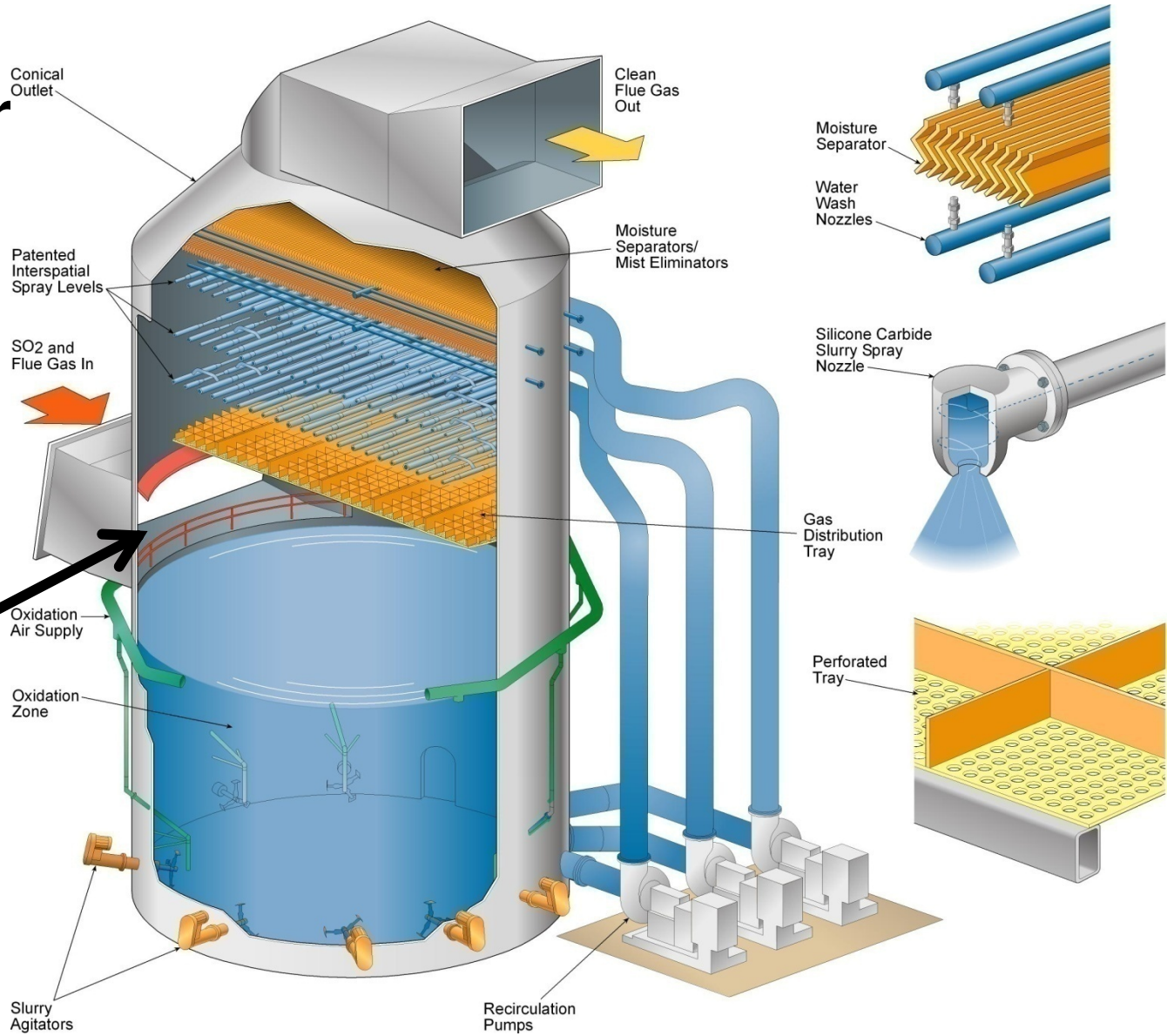
Absorber inlet gas temperature (typically 300°F) is well above the acid dew point

- Exotic materials not required

Materials can be:

- Unlined ASTM A36 carbon steel or A242 corten steel for flue, and damper frame and blade.
- Damper seals can be 300 series stainless

B&W Spray Tower Absorber with Tray



Inlet Zone

Inlet Wet/Dry Interface

This interface is exposed to both the incoming dry hot flue gas, and the absorber slurry sprays.

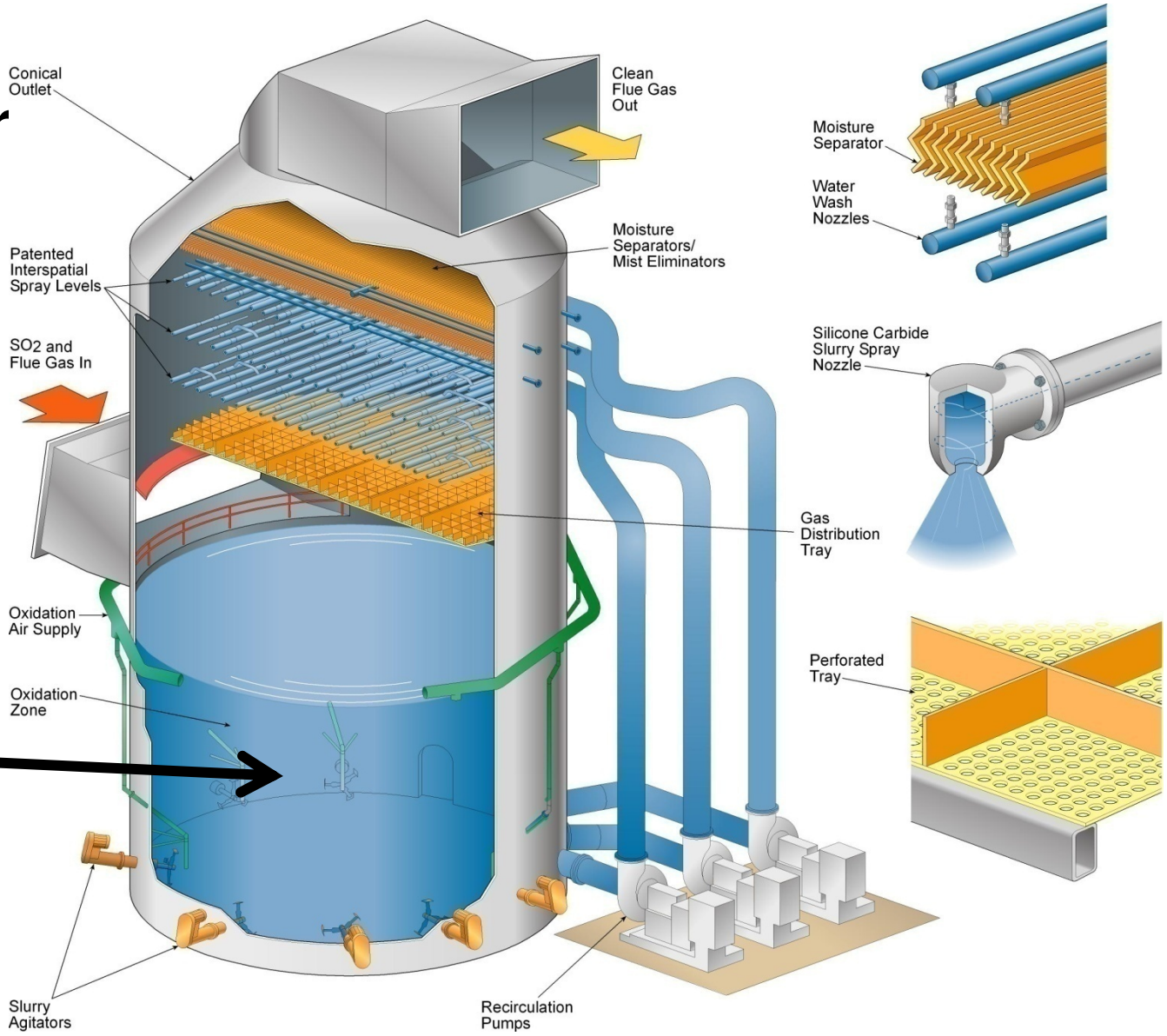
Due to evaporation, concentration of chloride ions in excess of **100,000 ppm** is possible beneath any deposits in this area due to concentration cells.

Material choices for this area include:

- High temperature flake-filled vinyl ester or epoxy linings, or
- High chrome-nickel-molybdenum alloys (solid, clad or wallpapered)

B&W Absorber Gas Inlet with Tray

B&W Spray Tower Absorber with Tray



Recirculation Tank

Recirculation Tank

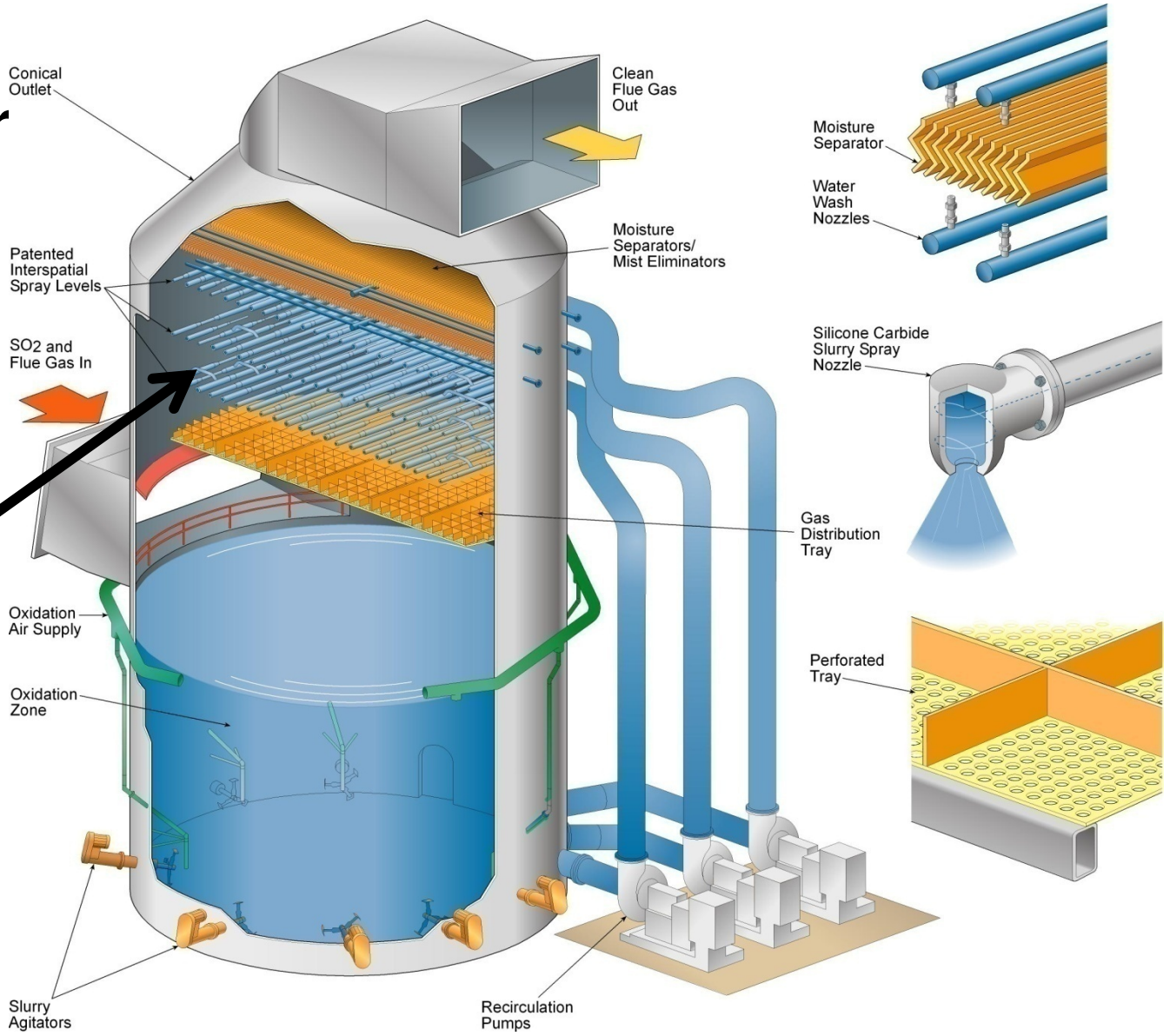
Integral to the WFGD tower structure

- Tank is exposed to the same corrosion-inducing environment as the spray zone

In addition to corrosion concerns, abrasive wear must also be considered for:

- The floor, from solids “sweeping” action due to agitator-induced and recirculation pump suction-induced currents
- Pump suction nozzles themselves

B&W Spray Tower Absorber with Tray



Spray Zone

Absorber Spray Zone

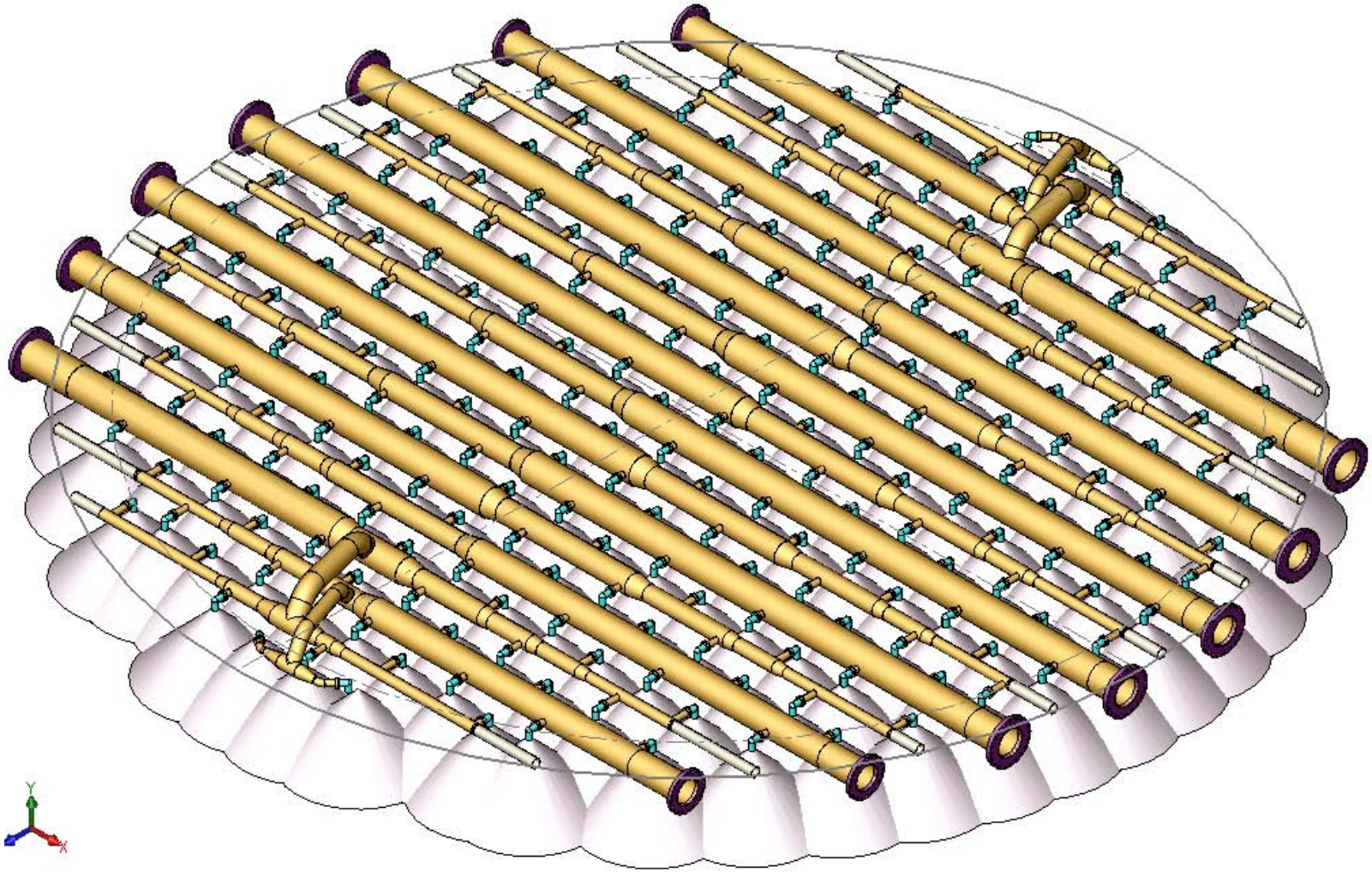
Multiple levels of headers with spray nozzles are used to provide complete cross-sectional coverage

- Overlapping coverage is necessary to avoid any untreated flue gas circumventing slurry spray contact.
- Slurry spray impingement (i.e. abrasion) against the shell, other headers/supports can occur.

Material selections for impingement areas include:

- Solid stainless steel or alloy
- Rubber lining
- Abrasion-resistant flake-filled resin coating
- Ceramic tile lining

Spray Headers & Nozzles: Full Coverage



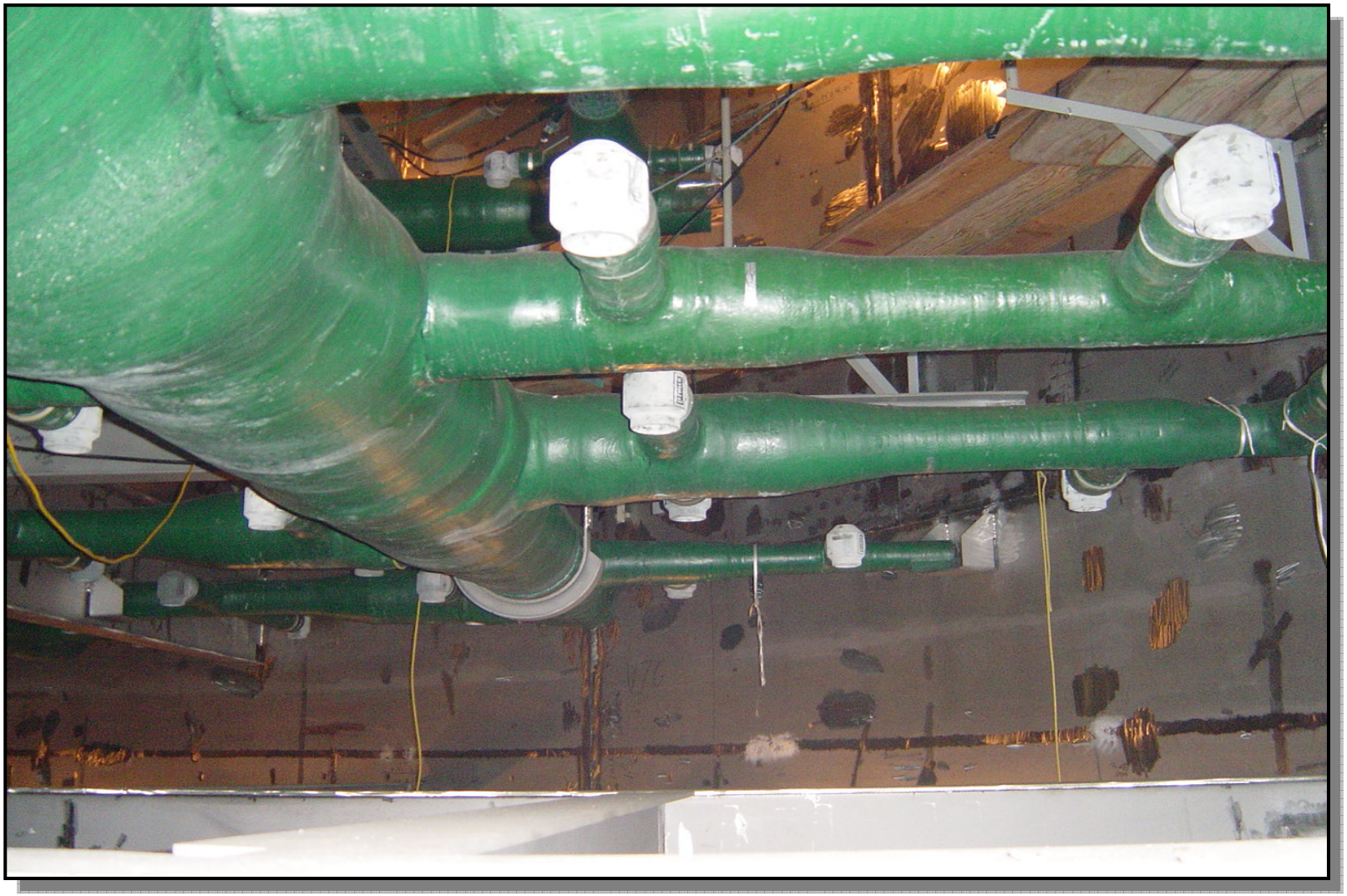
In a Wet FGD Absorber: A Very Heavy Rainstorm !

Imagine the heaviest rainstorm you have experienced, which might be 6 inches of rain per hour.

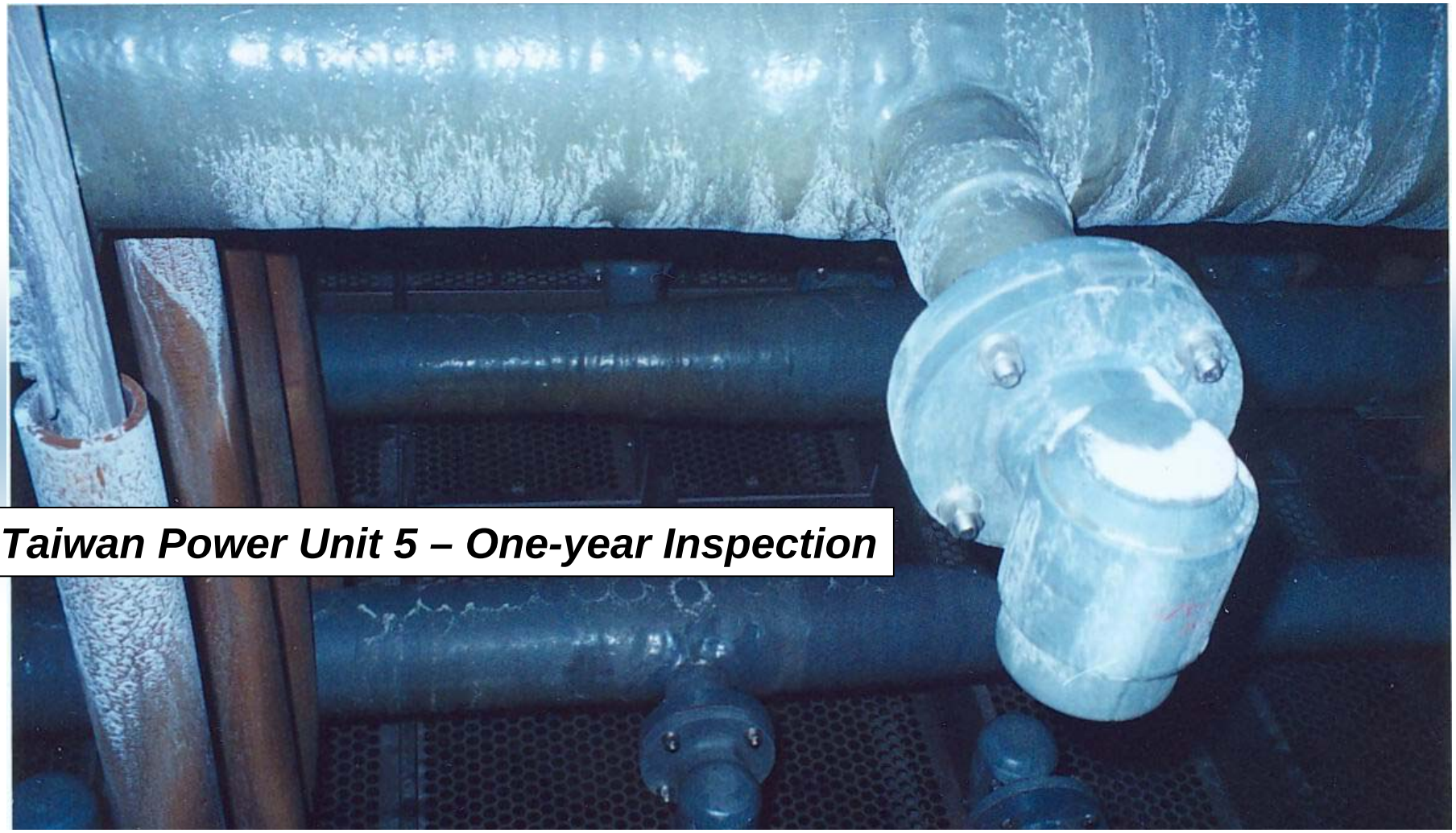
100 L/G (gal/1000 ft^3 of flue gas) in a Wet FGD absorber operating at a typical 12 foot per second superficial gas velocity is equivalent to 6929 inches per hour !

Alloy Spray Headers

FRP Spray Headers

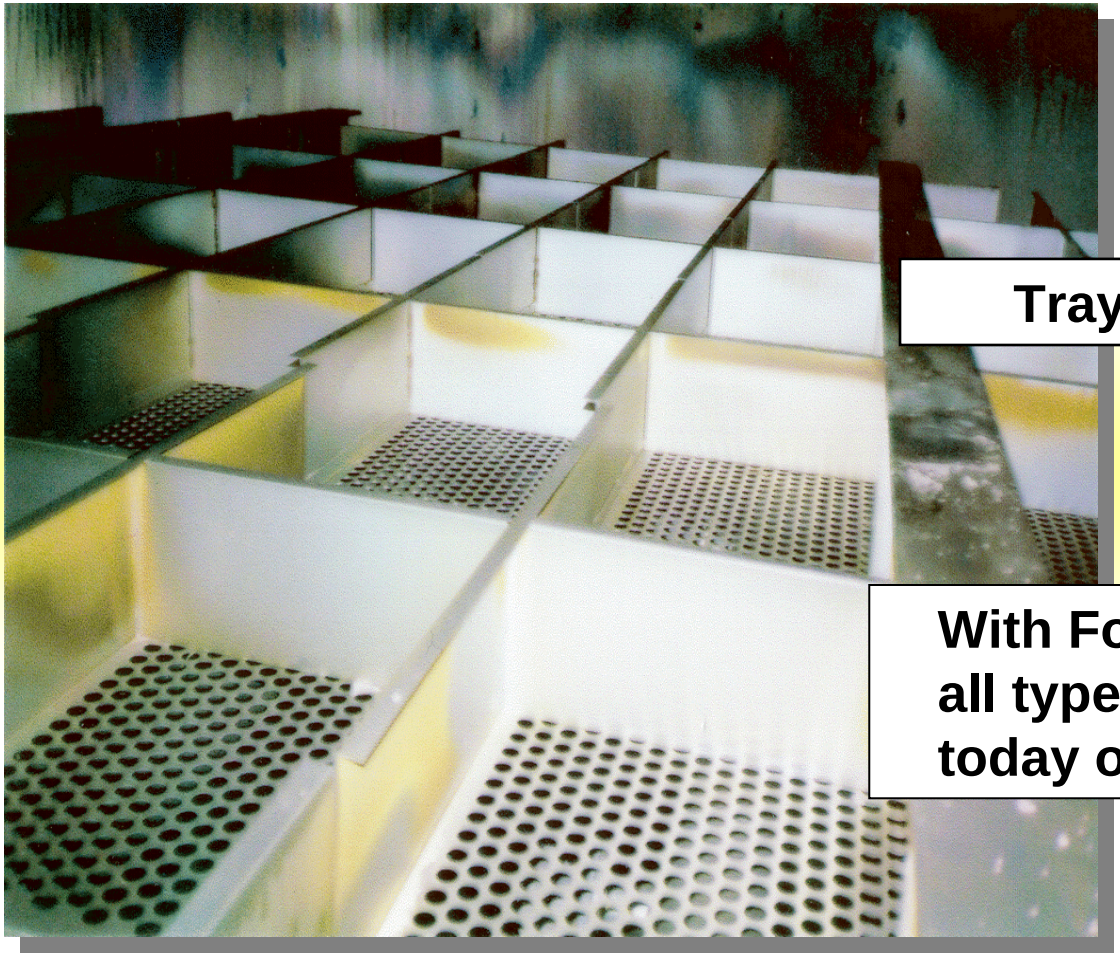


FRP Spray Headers & Tray



Taiwan Power Unit 5 – One-year Inspection

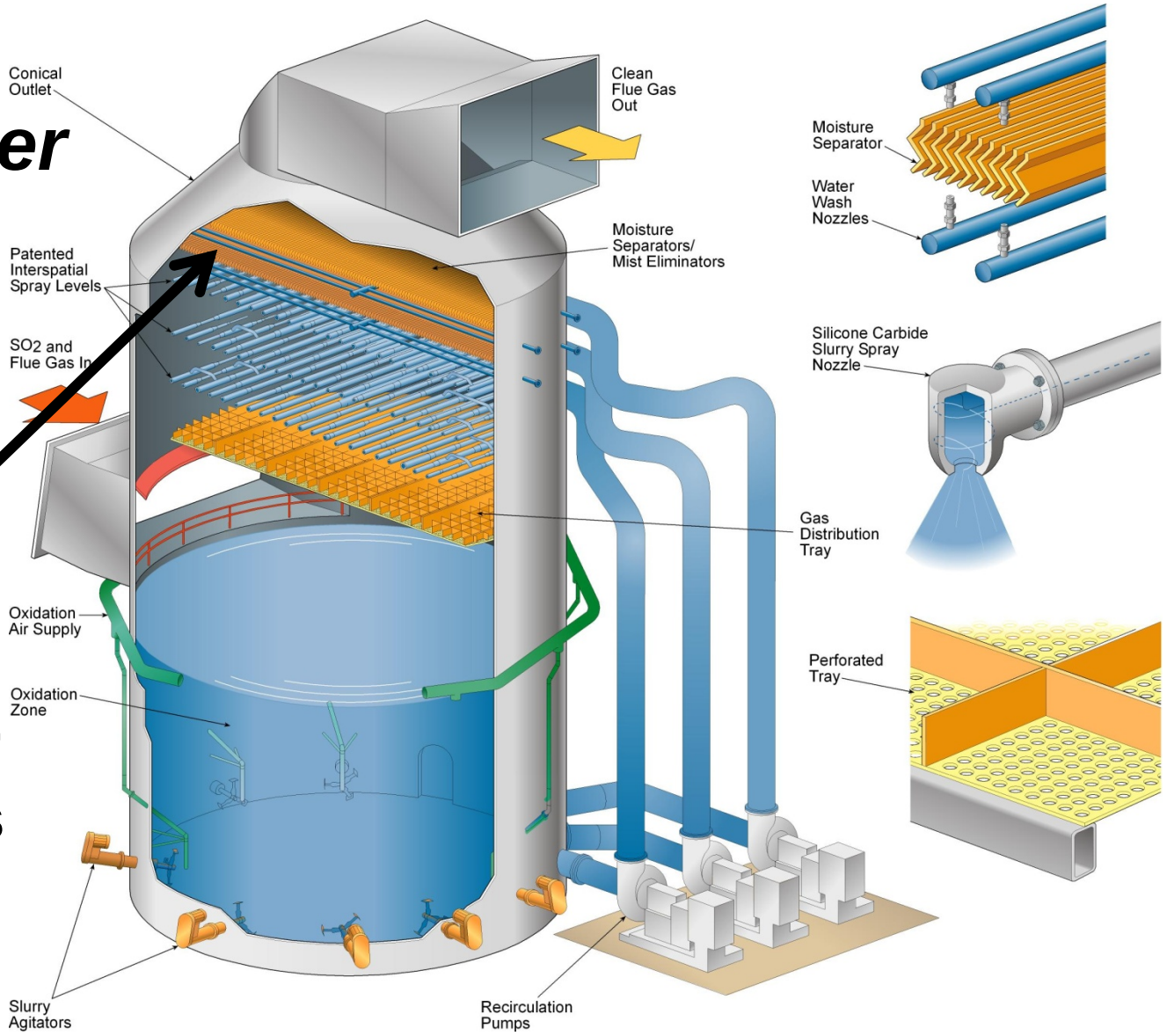
B&W Absorber Tray



Trays Stay Clean

With Forced Oxidation, all types of FGD systems today operate scale-free

B&W Absorber Tower



Absorber Tower Mist Eliminators

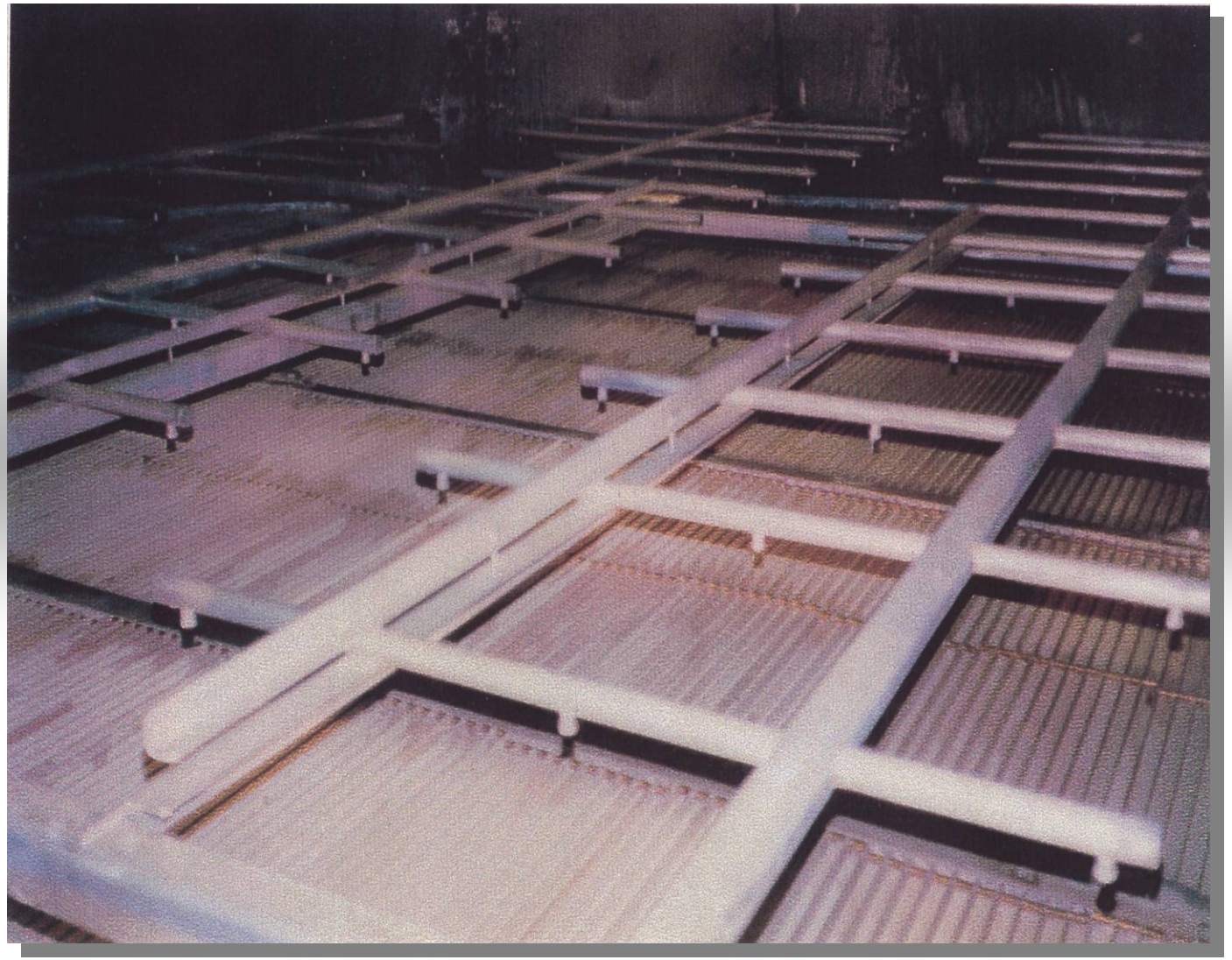
Mist Eliminator and Outlet Hood Zones

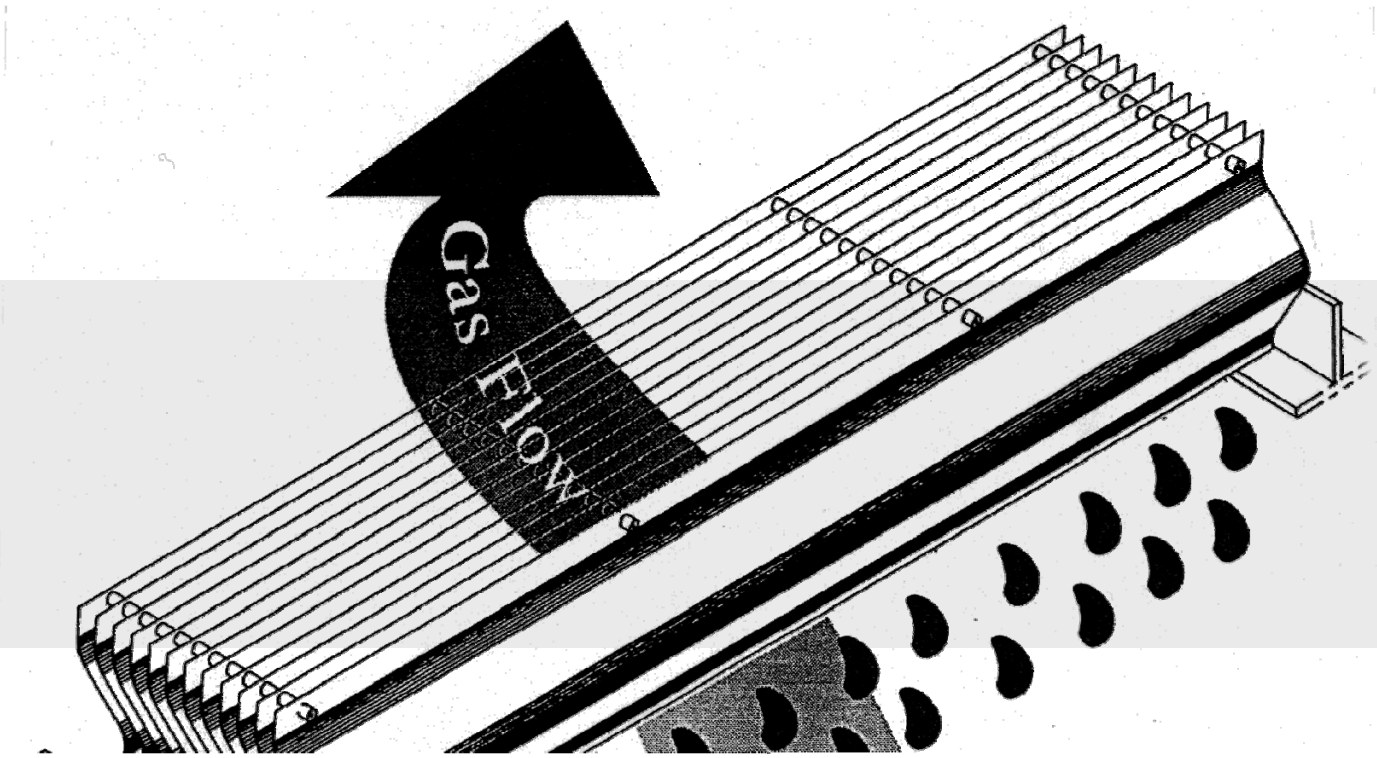
Key concern is corrosive attack by sulfurous and sulfuric acid, resulting from the combination of wash water with the residual SO_2 and SO_3 in the clean gas.

Typically the same materials used for the absorber's recirculation tank and spray zone are used for the mist eliminator and outlet zones, even though the environments are vastly different.

Few problems have been reported with this "in kind" materials use approach due to the dilution effect from the high moisture, especially with condensation at the cooler shell surface.

Top of Level of Mist Eliminators w/ Wash Header




Gas Flow