Yellowstone Power Plant
Air Cooled Condenser

Yellowstone Power Plant

Commissioned a Zurn Balcke-Durr Air Cooled Condenser (ACC) in 1995.

YPP ACC

- Each module (cell) contains 1 fan and 6 finned tube bundles.
- The ACC has 10 cells consisting of 8 condensing cells and 2 reflux cells.
- The ACC consists of 10 cells or 60 finned tube bundles in a 3 tube row arrangement.
- The finned tube bundles have 211 galvanized coated carbon steel, single pass, oval tubes.

YPP ACC

- The ACC has 10, 26 foot 10 bladed fans driven by a 2 speed gear reduced motor.
- The ACC fans turn at 125 RPM in the fast mode and 63 RPM in the slow mode.
- The fan motors have reverse contacts to reverse the fans in severe winter conditions.

Center of ACC

ACC Fan

ACC Problems

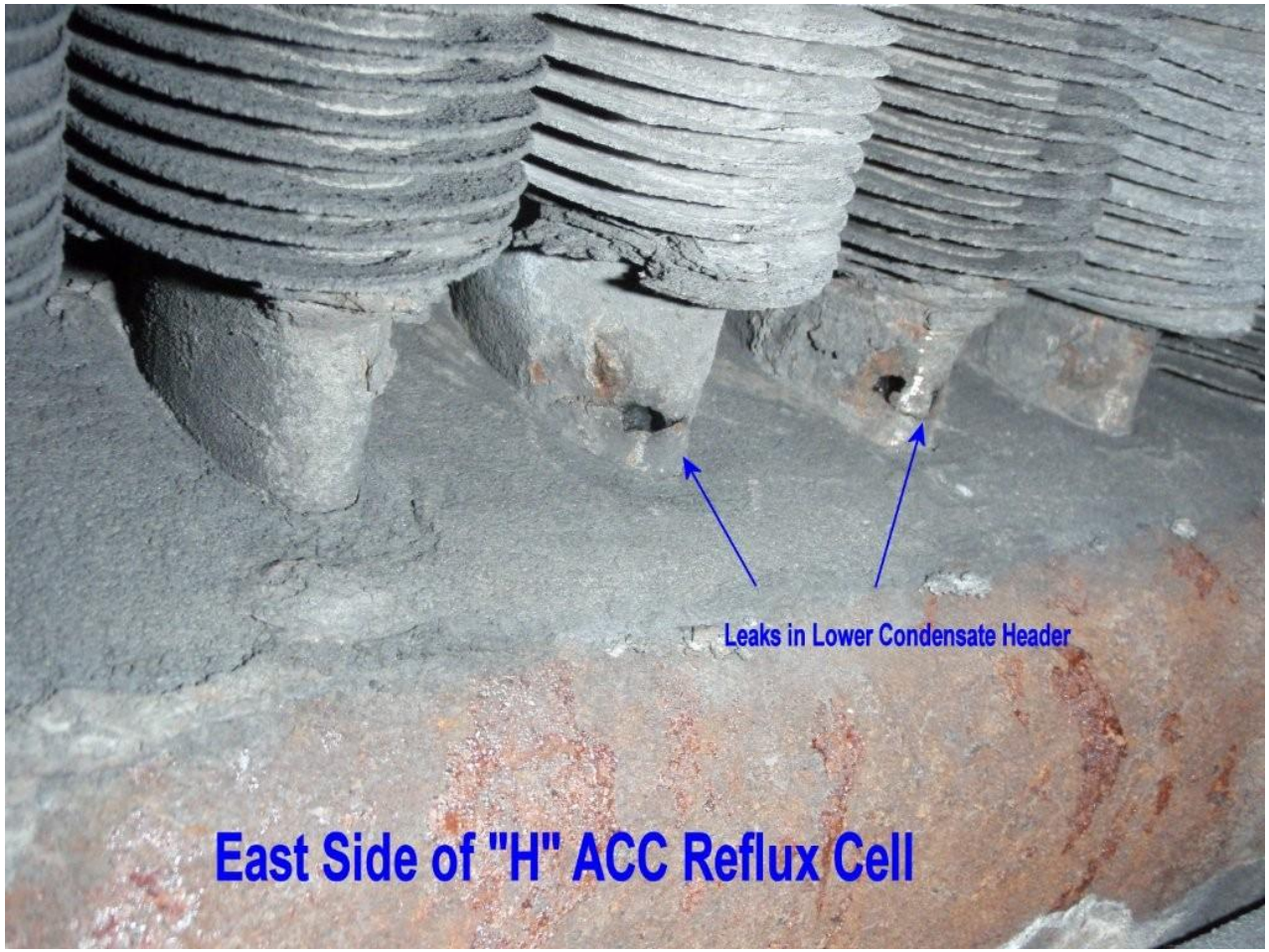
Tubes that are frozen and degraded from debris being trapped behind support beams

Frozen burst tube

Holes in the top of the tube connections to the steam header

Removal of outer tubes to gain access to inner row tube leaks

Leaks in tubes at lower condensate header connections



Severe debris build up on the finned tubes

Total debris blockage of tube fins

Environmental problems

- Wind
- Debris (cotton from cottonwood trees, ash, coke dust, ect.)
- Cold weather
- Hot weather

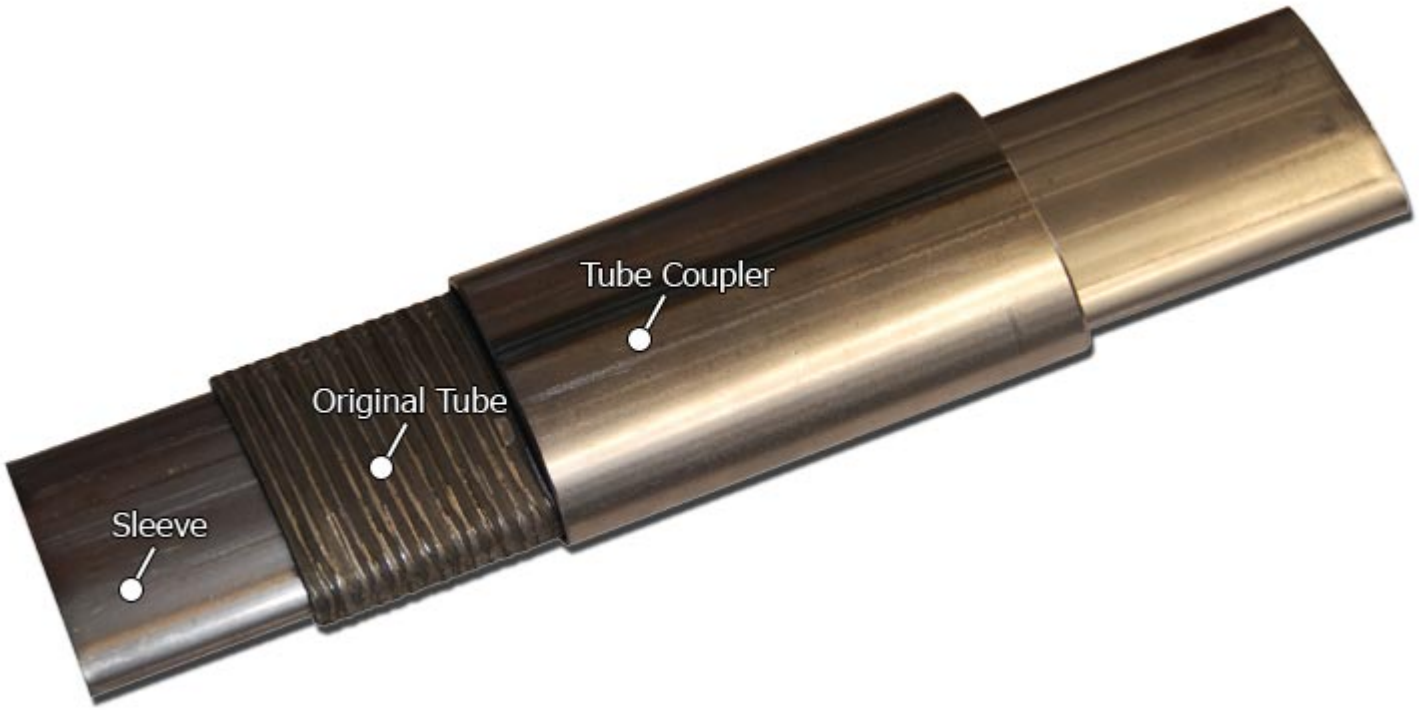
Solutions

YPPs solutions

- Use of underground cable shrink wrap and aluminum duct tape to patch major leaks in tubes.
- The use of sleeve inserts and outer sleeves to fix tube to header connection leaks
- Sandblasting and pressure washing of tubes to remove debris from finned areas.
- The use of epoxy paints to help preserve and close pin hole leaks in steam header connections and condensate headers.

Cable shrink wrap to repair major holes in tubes

Tube sleeve inserts and outer couplers



Epoxy paint

Holes in tube headers

Holes repaired and epoxy painted

Sandblasting and pressure washing

Debris in tube fins

Tube fins after sandblasting and pressure washing

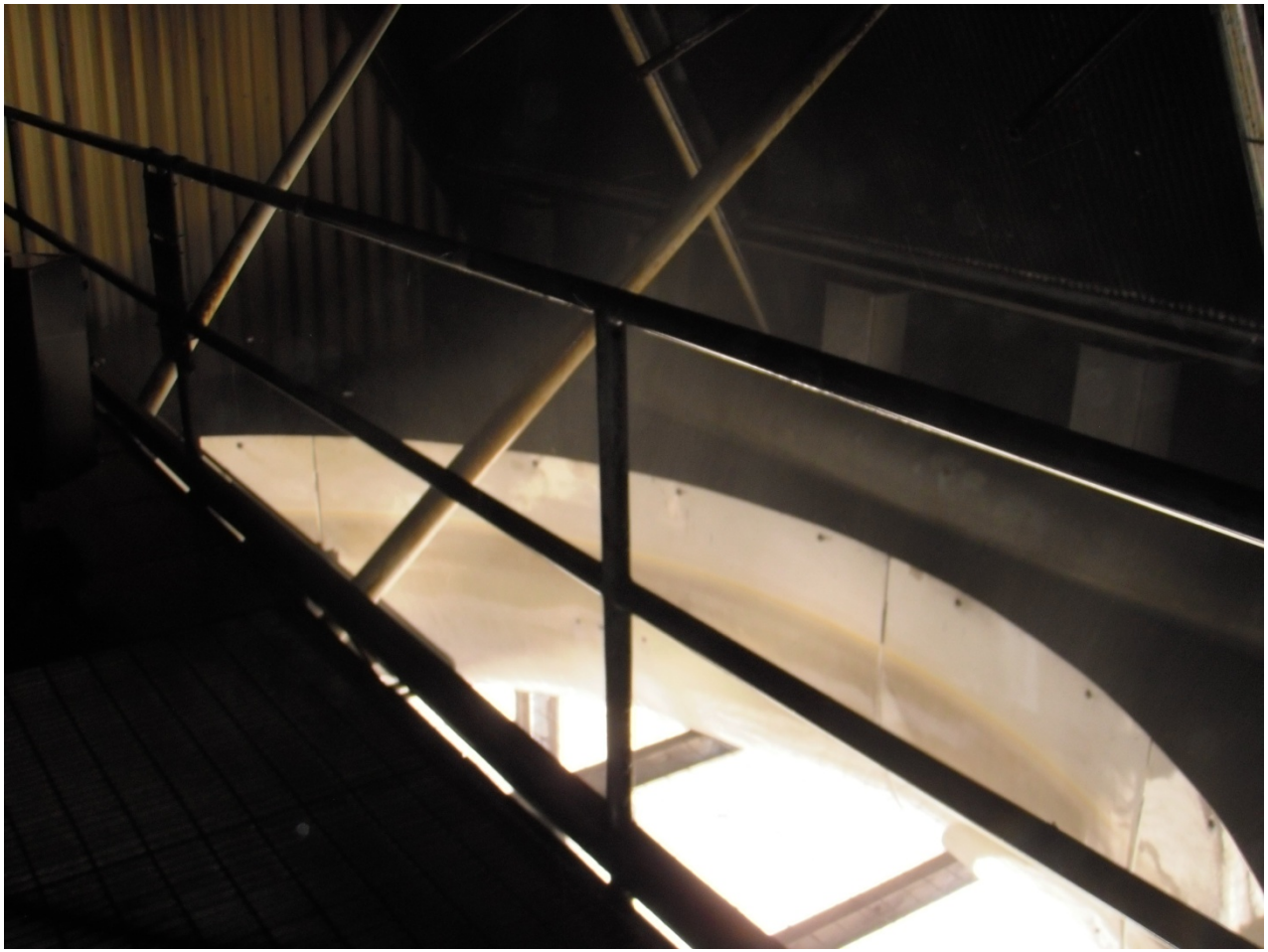
Environmental solutions

- High pressure washing of the ACC by Conco
- Wind fence on the ground in the center of the ACC
- Wind wall on top of the ACC
- Many different water spray systems

Wind Fence

Water Sprays

Best water sprays



Wind Wall on top of ACC

ACC Washing from the outside

ACC Washing from the inside

Discussion