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Case Study — Clogged Fines Chute Under Feeder to Jaw

Situation

Feeder → fines chute → primary jaw. Wet fines (sand/silt + minus 1–2" fragments). Frequent hang-ups/arching at mid-chute; surging feed into the jaw; manual rod-outs every shift. Existing liner: Arco slick plate (chromium-carbide overlay type). Tight chute geometry and water overspray worsen conditions.

Root-Cause Analysis

1. Too shallow and too tight chute geometry (≤50° angles, 6–8" outlet slot).
2. Excess moisture from sprays and carryback raises cohesive strength.
3. CCO 'slick plate' ineffective with wet fines paste.
4. Sharp transitions encourage bridging.

Corrective Actions

Operations & Water Management	Re-aim sprays; install drip-lips, drains, and interlocks.
Flow Aids	Add pneumatic air cannons, knockers, or vibrators at arch zones.
Liner Strategy	Use Hardox/AR at impact; UHMW-PE (TIVAR-88) in slide zones.
Geometry Fix	Steepen walls to 68–72°; widen outlet to ≥12"; add rock-box.

Expected Results

- Unplanned stoppages reduced from daily to ≤1 per week.
- Manual rod-outs cut by >90%.
- Jaw utilization increased by 5–10%.
- Liner life extended 1.5–2× in impact zones.

Bill of Materials (Retrofit)

- 1" UHMW-PE liner panels with SS fasteners.
- Hardox 450/AR400 plates for impact zones.
- Two air cannons (50–100 L) with valves and PLC I/O.
- One heavy-duty vibrator with VFD.
- Skirt drip-lips, drains, sump hardware.

Implementation Plan (NWS Turnkey)

1. Laser scan chute/jaw interface.
2. Run material tests (PSD, moisture, wall friction).
3. Issue GA drawings and fabrication details.
4. Stage 1: Water management + liner retrofit.
5. Stage 2: Geometry change (new lower chute body).
6. Commissioning: Tune cannons, sprays, vibrator.
7. 30-day performance check with KPI tracking.

Chute Retrofit Concept Sketch