

# PES

PRACTICAL ENGINEERING SOLUTIONS LLC

Concept + Design + Construction

## 25-3595 MOR Tower 2 Deflector Gate

### Project Overview

Practical Engineering Solutions was engaged to design and deliver a fast-acting deflector gate system for a bulk material handling application where metal detection in the process stream required immediate diversion to protect downstream equipment. The system was required to detect metallic contamination and fully actuate the gate, open and close, within an approximately one-second response window.

### Engineering Approach

PES led the project from initial concept through fabrication, drawing on prior experience with manually operated deflector gates as a starting point for the structural design. The gate assembly was engineered to withstand process loads while achieving the required actuation speed and reliability. Structural analysis was performed to validate the design under operating conditions and to ensure long-term durability in an industrial environment.

To meet the aggressive response time while maintaining system reliability, PES developed a hydraulically actuated solution controlled by a PLC-based control system. Given the intermittent nature of the gate's operation, the hydraulic system was optimized around a compact hydraulic power unit paired with an accumulator. The HPU was configured to recharge the accumulator only when system pressure dropped below a defined threshold, reducing energy consumption and wear while ensuring immediate availability when an actuation event was triggered.

### Execution & Delivery

PES managed the full project lifecycle, including detailed mechanical and controls design, equipment selection, procurement, and fabrication of all system components, executed by a two-person, senior-led team. Close coordination across mechanical, controls, and fabrication disciplines ensured the final system met performance requirements without unnecessary complexity.

#### PES Deliverables:

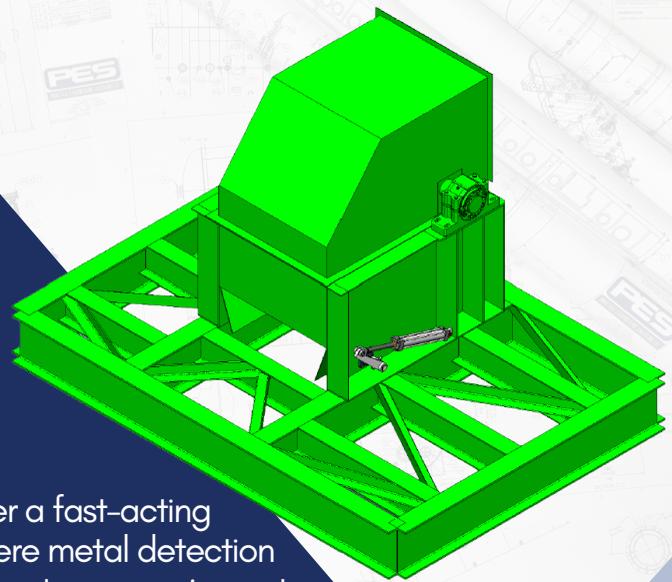
- Structural Design & Engineering of the Gate
- PLC Design
- Hydraulic Component Selection & Purchasing
- Fabrication of Structural Components

#### Project Timeline:

- Structural Design & Engineering: 15 Days
- PLC / Hydraulic Design & Component Delivery: 13 Weeks
- Fabrication: 8 Weeks

Estimated Total Installation Cost (TIC): \$95,000

The project was delivered on schedule and within the approved budget. Final installation and commissioning are planned to coincide with a future site turnaround, minimizing operational disruption for the facility.



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