FIVE COMMON Bottlenecks in Grain Facilities

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Today’s takeaways

- Alleviating site traffic issues
- Hiccups in grain receiving and material handling
- Finding the balance of labor and automation
- Effective use of outside storage
- Maximizing rail receiving / loadout for shuttle trains
Movement matters

Bottleneck 1: Alleviating site traffic issues
1. Alleviate site traffic issues

• Staging areas
• Routing
• Scale & probe locations
Grain on the go

Bottleneck 2: Hiccups in receiving & material handling
2. Hiccups in receiving & handling

- Size of receiving pit
  - Grate
  - Hopper
2. Hiccups in receiving & handling

- Have someone to open truck hoppers
  (limit distractions if truckers remain in their trucks)

- Receiving equipment sized appropriately

- Consistent pits for varying commodities
It’s about balance

**Bottleneck 3:** Finding balance between automation & labor
3. Balance automation & labor

- Labor is becoming harder to find and retain
- Consider automation
  - Why is it good?
  - What degrees of automation are available?
3. Balance automation & labor

Example of partial automation

- PLC
- Safety devices
- Bin inventory system
- Tied into accounting software
3. Balance automation & labor

Example of full automation

- RFID system
- Limits employee numbers
- Keeps truckers in their trucks
- Helps mitigate product placement errors
Grain stash

Bottleneck 4: Effective use of outside storage
4. Ground piles vs. Bunkers vs. Buildings
4. Ground pile

Labor intensive, higher product damage risk

- Dumped on prepared earth surface
- Fill with portable conveyors
- No aeration
- May or may not be tarped
- Pile reclaim equipment
- Short-term storage
4. Bunker

Time consuming to tarp & reclaim

- Hard surface or prepared earth
- Fill system tied to receiving
- Aeration
- Bunker walls
- Tarping system
- Reclaim system and/or pile reclaim equipment
4. Flat storage building

More time consuming to reclaim vs. upright storage

- Concrete floor
- Fill system tied to receiving
- Aeration
- Side walls
- Roof structure
- Reclaim system
- Maximize storage space
4. Storage reclaim

- No trucks required to reclaim
- Varying projection into storage
- Shallow trench or full tunnel
Making rail work

Bottleneck 5: Maximize rail receiving / loadout for shuttle trains
5. Maximize rail receiving / loadout

- What speed do you want to load at?
  - How many cars do you have to load?
  - How fast do you need to load the train?
  - What type of track layout is available?

- Operations
  - Track studies
  - Track layout
5. Master Planning
5. Sequence of Operations

Existing conditions
5. Sequence of Operations

SEQUENCE
INDUSTRY LOCO PUSHES CARS THROUGH
SCALE/RECEIVING BUILDING TO SCALE EMPTY
CARS

TIMING (10 MIN)
600 METRIC TONS = 15.15 HRS
280 METRIC TONS = 25.01 HRS
250 METRIC TONS = 26.46 HRS

LEGEND
- CP MAINLINE
- EXISTING TRACK
- PROPOSED TRACK
- FULL CARS
- EMPTY CARS
- LOCO

TO WEST KC JCT
DERAIL
T-2 CROSSOVER 1
T-1
UPRR CLINTON SUB 2
UPRR CLINTON SUB 1
T-4
12
T-5
T-3
T-6
T-7
10
70
70
70
70
12
12
EXISTING SCALES
T-11 CROSS OVER 2
IN MOTION SCALE
RELOCATE T-8
RELOCATE T-9
RELOCATE T-10
EXISTING
T-12
T-13
5. Sequence of Operations

SEQUENCE
INDUSTRY LOCO MOVES 14 CAR STRING TO TRACK 734 CLEAR OF CROSSOVER 2

NORTH

TIMING (-)
500 METRIC TONS = 15.16 HRS
280 METRIC TONS = 25.81 HRS
250 METRIC TONS = 26.46 HRS

LEGEND
CP MAINLINE
EXISTING TRACK
PROPOSED TRACK
FULL CARS
EMPTY CARS
LOCO

TO WEST KC JCT
5. Sequence of Operations
Final
5. Maximize rail receiving / loadout

• Importance of capacity sizing
  • Adequate bin storage to hold train loads
  • Size of reclaim & blending equipment
  • Bulk scale sized with adequate upper & lower garner size to keep system from shutting down
  • Loading spout easy to run & flexible to adjust for car misalignment
5. Master Planning

Site issues
5. Master Planning
Land purchase
5. Master Planning

Land purchase
5. Master Planning
Existing utilities
Thanks for your time today

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