AAPA Facilities Engineering Seminar & Expo

“Not just for containers anymore”

Bulk Handling – Ken Upchurch / BRUKS Rockwood
AAPA Facilities Engineering Seminar & Expo
“Bulk Handling”

Presentation Agenda:

• BRUKS Company Overview

• Examples of Bulk Handling at Export Terminals

• What is emerging in North America today

• Questions
Company Overview:

“BRUKS Rockwood is a Provider of Bulk Materials Handling Solutions”
History BRUKS Group

1897 Klöckner GmbH
1959 Bruks Mekaniska AB
1979 Rotom Verkstäder AB
1984 Celltec Engineering AB
1998 Rockwood Materials Handling

2000 BRUKS AB aquires Klöckner GmbH
2004 Bruks Inc Atlanta is established
2006 New owner JCE Group
2006 Acquisition of Celltec Engineering AB
2007 Acquisition of Rotom
2008 Acquisition of Rockwood
Equipment Portfolio
Bulk Handling at Export Terminals:
What products are shipping in "bulk" form?

2012 US Annual Exports Short Tons

Source: US Energy Administration
1. **Receiving:**
   Materials are either produced locally and delivered to the terminal by conveyor or the materials are produced elsewhere and transported to the terminal by road, rail or water.

2. **Storage:**
   Once materials are received, they are stored or consolidated awaiting bulk transport.

3. **Loading:**
   The consolidated materials are then loaded onto bulk vessel for transport to the final destination of use.
1. **Receiving:**
The majority of bulk materials are being transported from the nation’s interior to coastal port terminals. The most cost effective mode of transportation is typically by train. In some cases, product is received by barge or truck.
What are the basic elements to a bulk terminal?

2. **Storage:**
Material, capacity and environment all factor into the type of storage utilized for most bulk material terminals. Large capacity water resistant materials are usually stored outside. Lower volumes of absorbent materials are under roof.
3. **Loading:**

There are a wide range of equipment technologies available for efficient vessel load out. The loader design is highly dependent on dock configuration, vessel size, loading capacity and material characteristics.
Example Projects:
Basic Characteristics

Annual Throughput: 1M Tons
Storage Capacity: 100k Tons
Inbound Capacity: 500 TPH
Outbound Capacity: 1500 TPH
Manual Storage:
- Stacking or receiving is scheduled in conjunction with the prilling operation
- Material is stacked-out using a fixed conveyor
- The pile is managed by operators using a dozer or front-end loader
- Material is pushed to a reclaim hopper (average ~900 STPH)
- The reclaimer feeds directly to a take-away belt
As Business Grows....
Future Design Allows for Automated Stockpile

**Automation Advantages:**
- Improved inventory control
- Lower OPEX
- Improved loading capacities
- Reduced material degradation

**Automation Disadvantages:**
- Higher CAPEX costs
Typical Equipment – Traveling Ship Loaders

Traveling & Luffing

**Traveling & Luffing Loader:**
- Allows the vessel to be loaded without relocation
- Trimming is accomplished by traversing the loader along the dock line
- The machine is equipped with a telescopic spout & trimming spoon
Pet Coke Export Terminal
Basic Characteristics

Annual Throughput: 1M Tons
Storage Capacity: 75k Tons
Inbound Capacity: 500 TPH
Outbound Capacity: 2500 TPH
Manual Storage:
- Stacking or receiving is scheduled in conjunction with the coking operation
- Material is typically stacked-out using a fixed conveyor
- The pile is managed by operators using a dozer or front-end loader
- Material is pushed to a reclaim pit (average ~2000 STPH)
- The reclaimer feeds directly to a take-away belt
Traveling, Luffing & Shutting Loader:
- Allows the vessel to be loaded without relocation
- Trimming is accomplished by traveling and shuttling (operating in x/y axis)
- The machine is equipped with a telescopic spout & trimming spoon
- The shuttle feature accommodates multiple beam widths
Basic Characteristics
Annual Throughput: 8M Tons
Storage Capacity: 1.3M Tons
Inbound Capacity: 1500 TPH
Outbound Capacity: 5000 TPH
Typical Equipment - Receiving

Barge Unloader

**High Capacity Receiving:**
- Material is produced elsewhere and delivered by river barge
- The continuous barge unloader (CBU) has a 1500 STPH capacity
- Unloaded material is conveyed directly to the storage pile
Automated Stacking & Reclaim:
- Traveling stacker (2x) builds a linear pile at a rate of 1500 STPH
- The stacker is designed to control and segregate materials as needed
- The linear bucket wheel reclaimer (2x) has a capacity of 2500 STPH
- Reclaimed material is delivered to the ship loader
Traveling, Luffing & Slewing Loader:
- Allows the vessel to be loaded at a 5000 STPH rate without relocation
- Trimming is accomplished by traveling and slewing (operating in x/y axis)
- The machine is equipped with a telescopic spout & trimming spoon
- The slew feature accommodates multiple beam widths
- Design works well with a dedicated fleet of non-geared vessels
What is being built in America today:
European renewable energy policies are driving the demand for wood pellets throughout the world. Some projections show North American exports growing by more than 10 million tons between 2013 and 2017. Typical ports are being designed to handle ~500,000 tons annually translating to 20 new export facilities in the next 4 to 5 years.
What is a wood pellet?

**Wood Pellet Characteristics:**
- Produced from whole tree chips (typically green)
- The green chips are dried to a moisture level of 5 – 10%
- The chips are then milled to produce a finer particle < 4 mm
- These particles are then processed into a pellet using a press
- This process generates excessive heat that requires the pellets to be “cooled”
- Once cooled the pellets are typically loaded for transport to the export terminal
- The pellets continue to generate heat for the next several days
- Eventually the pellet heat stabilizes and can be loaded onto ocean going vessels
Heat Control – the internal heat generated by the wood pellet can reach a combustion point. The result can be fire or explosion. Aeration and heat monitoring are a MUST.
Degradation & Dust – pellets are constructed by forming small particulates through a die. If not handled properly, the pellet can be broken down into its original form creating large quantities of airborne particulates.
Pellet Terminal Challenges

**Water** – pellets are NOT water resistant. When introduced to water, the smaller particles act as absorbent and the pellets turn to “mush”
Basic Elements – Pellet Export Terminal

- Loading
- Storage
- Receiving
The majority of the plants being built are looking for ports with rail access.
Conveyors are protected to allow for unloading in all weather conditions as well as to reduce dust emissions.
Most terminals are being designed to store at minimum of 50,000 tons under roof in either a linear or circular storage facility.
Manually operated equipment is commonly used for reclaim operations.
Excessive degradation, operating costs and loading efficiencies are spurring development of new reclaimer technology.
A variety of loading equipment has been tried including portable, fixed and traveling machines.
In Closing:

Bulk Handling will be a constant for future terminal operations in North America

Economic and political forces will continue to influence the material types and volumes that are handled

There is not a “one size fits all” design that suits all operations and materials. Flexibility in design is critical
Questions?

Please feel free to contact:
Ken Upchurch
Vice President Sales & Marketing
BRUKS Rockwood
770-849-0100 x109
kuh@bruks.com