

Grain Operations Webinar Series





Webinar 1

Introduction to Grain Operations

Presenter:

Jim Voigt, President, JFV Solutions Inc.



Outline – Operations Webinar 1

- 1) Definition of grain handling**
- 2) Types of grain handling facilities**
- 3) Operational procedures**
- 4) Component parts of an elevator**
- 5) Elevator procedures and policies**
- 6) Summary**
- 7) Questions and discussion**



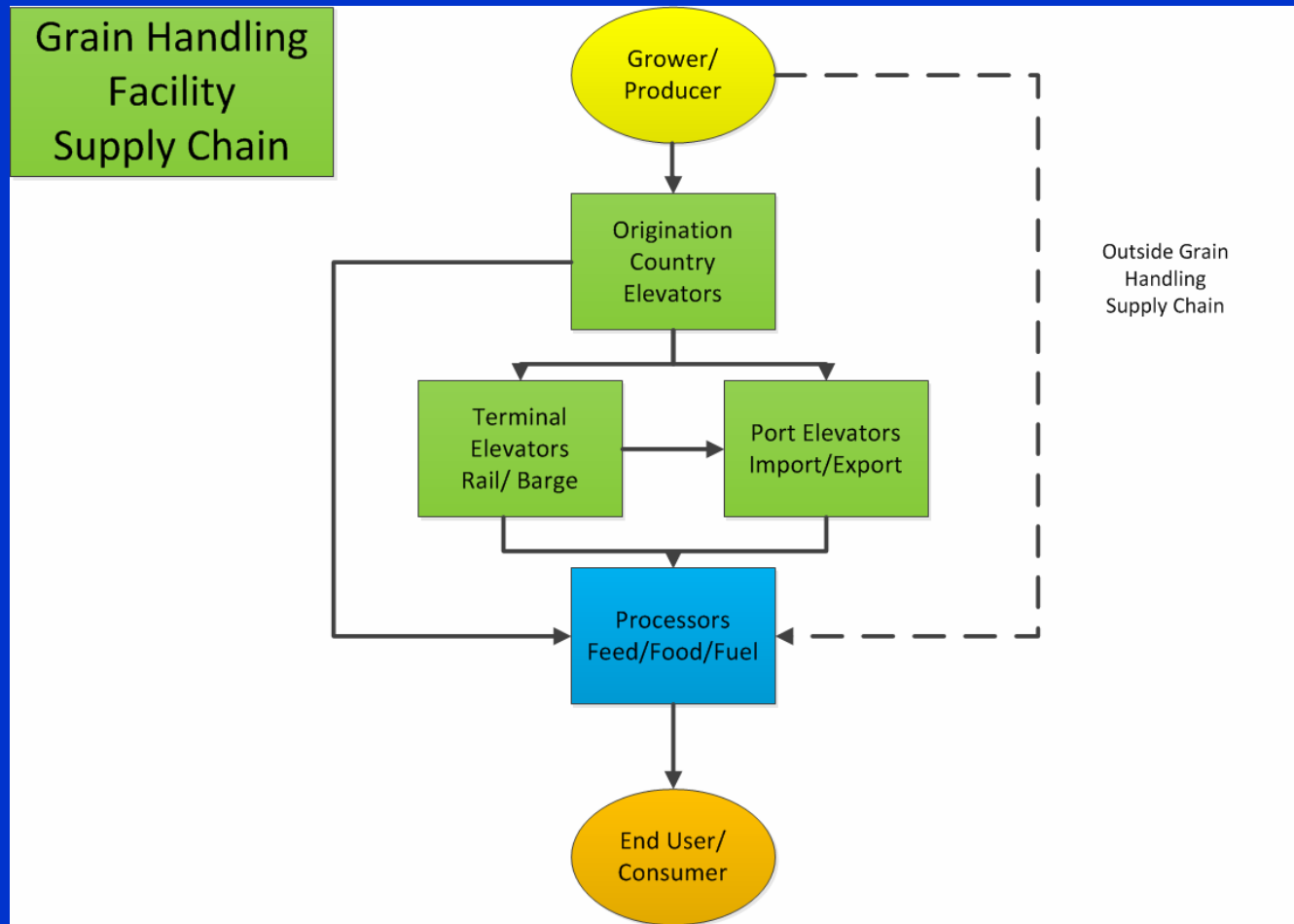
Purpose of a grain handling facility

- **To receive , process, store, and ship grains and oilseeds.**

Purpose of a grain handling facility

- **Provide the first steps in the feed, food, and fuel supply chains**
- **Act as the facilitator between producers and feeder/processors.**
- **Provide storage and secure the worlds grain related food supplies (sustainability).**

Grain facilities in feed, food, fuel supply chain



Basic types of grain handling facilities

Barge Terminal



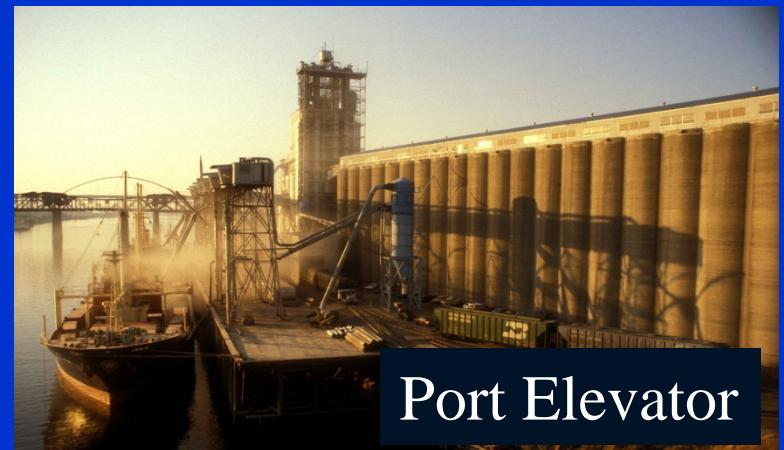
Origination Elevator



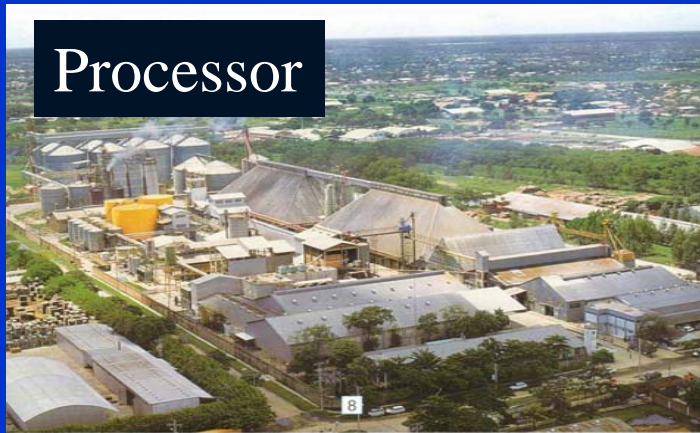
Train Terminal



Port Elevator



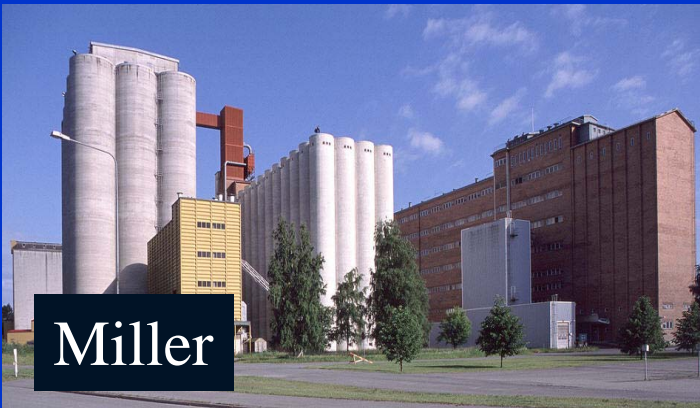
End Users – processors, feed and flour mills, feeders



Processor



Feed Mill



Miller

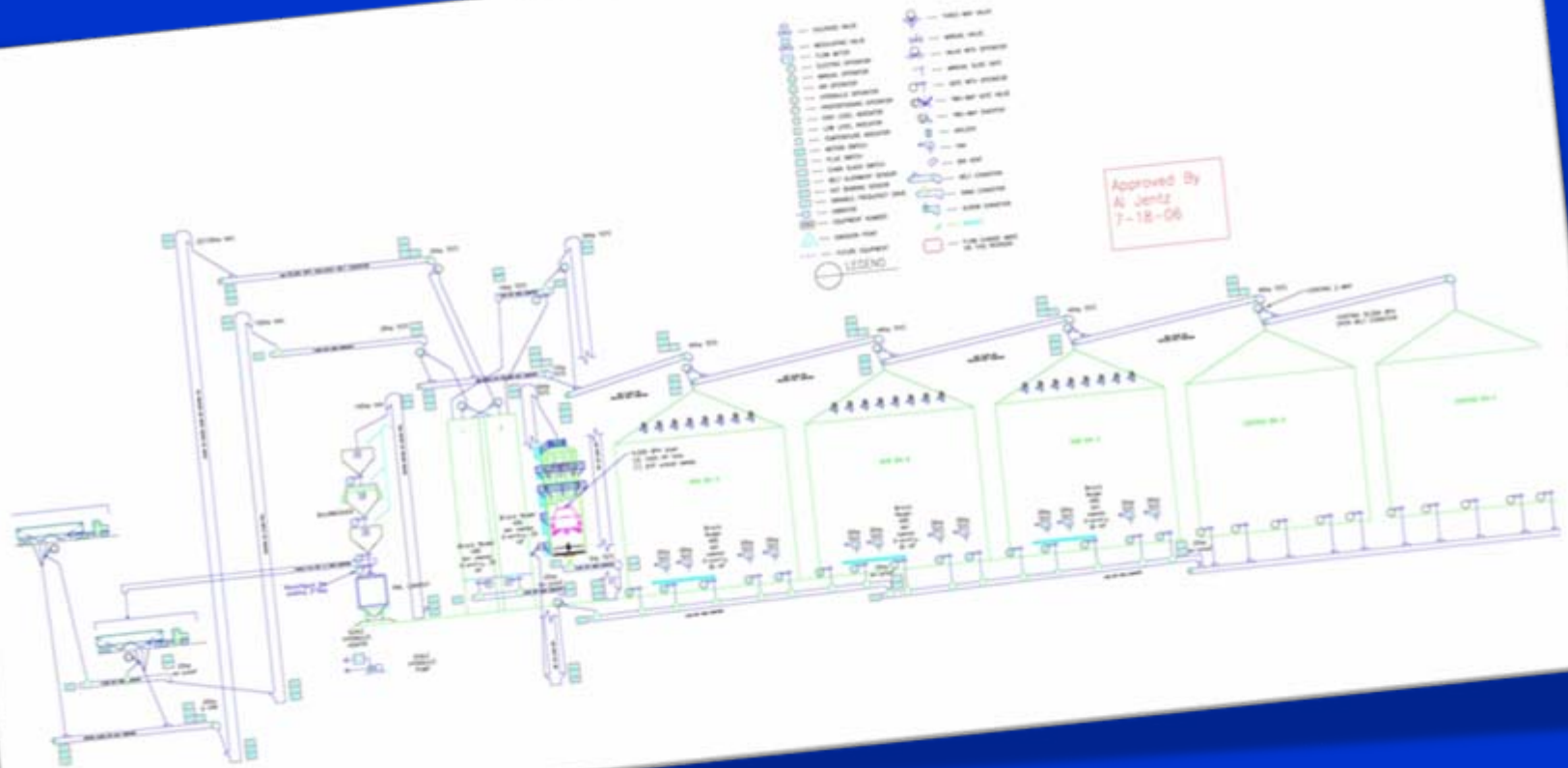


Feeder

Operational procedures of a grain elevator

- 1) Receiving and inbound procedures.**
- 2) Processing procedures.**
- 3) Storage procedures.**
- 4) Shipping and outbound procedures.**
- 5) Documentation requirements and procedures (Records).**
- 6) Other.**

Process flow diagram – “the place to start!”



Operational procedures

Receiving – the physical act of taking delivery and possession of grain from a customer into a grain handling facility.

This includes sampling, grading, weighing, binning, and creating appropriate documents.



Operational procedures

Processing – the physical act of conducting a process that changes or maintains the physical appearance or characteristics of the grain.

This would include scalping, cleaning, drying, aerating, sizing, polishing, cracking, etc. .

Handling procedures

Storage – the physical act of placing grain into one of the various types of containment or structures and holding it for a period of time.

This would include the procedures to manage grain inventories to retain their value.

Operational procedures

Shipping – the physical act of outbound movement (loading out) of grain from elevator/silo inventories.

This would include loading operations, blending, sampling , testing, and weighing procedures.

Operational procedures

Records - accurate and timely handling of all required documents such as but not limited to :

- 1. Scale tickets / grade information**
- 2. Inventory records**
- 3. Maintenance records**
- 4. Safety records**
- 5. Regulatory records**
- 6. Transportation documents**

Component parts of an elevator

- 1) Receiving / Inbound**
- 2) Conveyance**
- 3) Distribution**
- 4) Processing**
- 5) Storage**
- 6) Shipping / Load out**



Component parts of an elevator

- 7) Safety Systems**
- 8) Regulatory Systems**
- 9) Automation**
- 10) Utilities**

Receiving / inbound components - continued

- 1) **Logistical**
- 2) **Sampling**
- 3) **Weighing**



Receiving / inbound components - continued

4) Hoist

5) Receiving pits



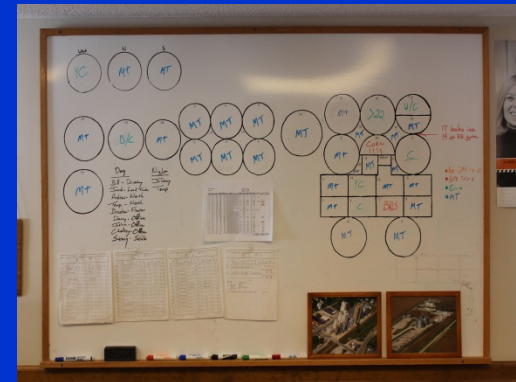
6) Conveyance – vertical and horizontal



Receiving / inbound components - continued

7) Control systems

Manual



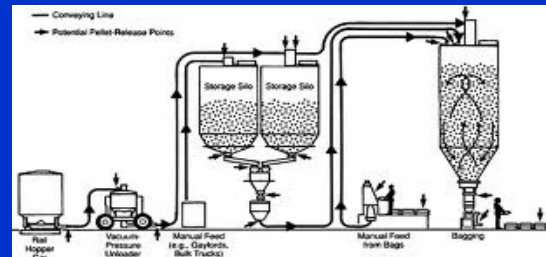
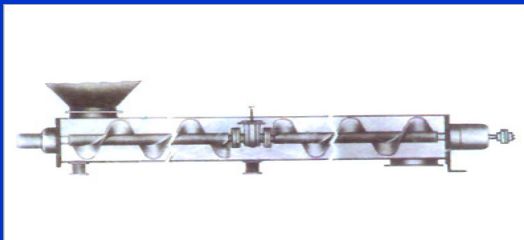
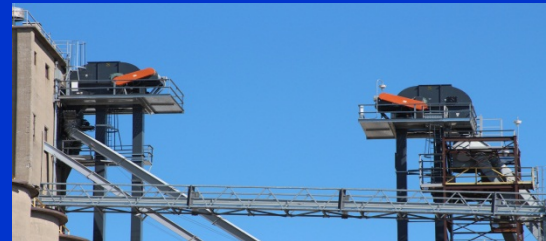
Automated



Partial
Automation

Types of conveyance

- 1) Horizontal – belt, drag, screw , etc.
- 2) Vertical – bucket elevator legs, conveyors, pneumatic systems.



Types of distribution

- 1) Direct spouts
- 2) Valves
- 3) Distributors/turnheads
- 4) Trippers



Processing

- 1) **Cleaning / scalping**
- 2) **Drying**
- 3) **Blending**
- 4) **Sizing**



Storage



Shipping / load out

- 1) **Spouts**
- 2) **Bins**
- 3) **Conveyance**
 - 1) **Vertical and horizontal**
 - 2) **Vacuums , frontend loaders, etc.**
- 4) **Sampling**
- 5) **Grading**
- 6) **Weighing**

Shipping / loadout - continued



Shipping Unit Comparison

Shipping Unit Comparison					
	MT's	Bushels			
Vessels	Panamax 2,000,000 + bu.		over <u>2.5</u> fifteen barge tows in a panamax	over <u>5.6</u> unit trains in a panamax	over <u>2,350</u> hopper trailers in a panamax
Handy	10,000-35,000 dwt				
Handy Max	35,000-50,000 dwt				
Panamax	50,000 - 70,000 dwt				
Capesize	80,000 - 172,000 dwt				
Barges	15 barge tow 780,000 + bu.				
Jumbo	2,360	93,000			
Box	1,500	60,000			
Rake	1,600	63,000			
Rail Cars	100 car unit train 355,000 + bu.				
Jumbo	90	3,543			
Box	50-70				
Trucks	Multiple axels and trailers can XX				
Hopper	20-24	750-950			
Flat trailer	18- 30				
Farm Truck	10-16				
Containers					
40'	18-20 mt				



Safety systems

- 1) Fire protection / dust explosions**
- 2) Guarding**
- 3) Fall protection**
- 4) Confined space entry**
- 5) Hazard communication**
- 6) Electrical safety**
- 7) PPE**
- 8) Evacuation plans**

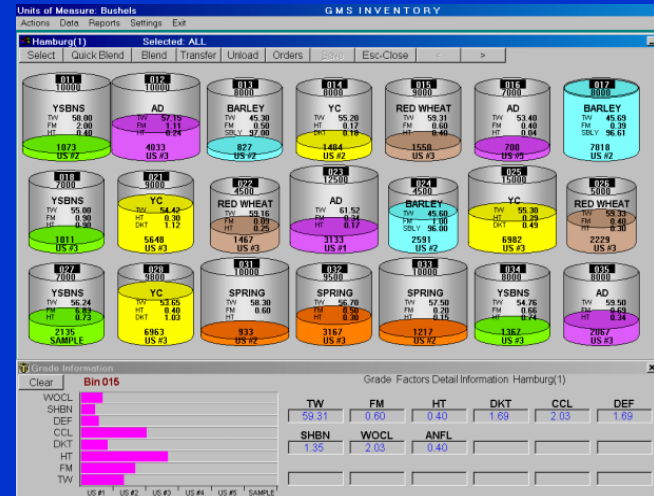


Regulatory systems

- 1) Dust control systems**
- 2) Noise abatement**
- 3) Water Management**
- 4) Traffic flow**
- 5) Navigational**

Automation

1. Process flows
2. Blending
3. Drying
4. Inventory
5. Energy management
6. Maintenance management
7. Environmental management
8. Other – weights, grades, etc.



Other utilities

1. **Compressed air**
2. **Generators**
3. **Wells/water systems**
4. **Electrical systems / lighting**





Programs

- 1) **Safety**
- 2) **Cost Management**
- 3) **Quality Management**
- 4) **Regulatory Management**
- 5) **Customer Service**

Customer service

- 1) Know customers needs.**
- 2) Good two way communication.**
- 3) Fair and consistent.**
- 4) Dependability – well maintained facility and equipment.**
- 5) Service – truck lines, drying , etc.**
- 6) Accurate and timely documents.**

Summary -

- **Grain handling facilities receive, process, store and ship a variety of grains and oilseeds.**
- **Grain handling facilities are a critical part of the food , feed, and fuel supply chain.**

Summary -

- **Grain handling facilities by their design and function have safety hazards.**
- **Employees must be attentive and follow all safety rules at all times.**

Disclaimer

- **This lesson is intended for a global audience that works in a variety of different styles of facilities as well as economic and governmental conditions. The content of this lesson is for informational purposes and to be used as it applies to your specific situation.**
- **The content of this lesson is not to take precedent over your current plant and /or company policies and programs ,nor and governmental regulations.**
- **The photos used in this lesson were for illustration of the topic and are not to be taken as a recommendation for any design or equipment depicted in them.**

GEAPS 500

'Introduction to Grain Operations'

Course Lectures: J. Voigt presenting those in yellow

1. **Introduction to Grain Operations**
2. Grain Receiving and Inbound Operation Procedures
3. Grain Sampling and Testing Operations and Procedures
4. **Binning Procedures**
5. Fundamentals of Grain Storage
6. Fumigation
7. **Grain Shipping**
8. Housekeeping and Grain Explosion Prevention
9. Maintenance and Recordkeeping programs
10. **Facility Safety**



Webinar 1

Questions?

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