



material handling  **logistics conference**
SPONSORED BY HK SYSTEMS

RFID 2.0 - What's Up?

Track 4 Session 7



Supply Chain  **Forward.**

Andy Bennett

Systems Engineer

HK Systems

andy.bennett@hksystems.com

262-860-6733

Abstract

- ▶ **RFID has settled into its zone as a valuable tool to track goods and assets. This tutorial will provide an update on the technology, the associated financials, and new applications that could wring cost out of your DC.**

Agenda

- ▶ **Update on the Mandates**
- ▶ **State of the RFID Industry**
- ▶ **Technology Advances**
- ▶ **RFID In Action**
- ▶ **Maintaining an RFID System**
- ▶ **New Applications to Drive Value**
- ▶ **Key Takeaways**
- ▶ **Questions**

What's Up with the Mandates?

▶ Wal-Mart



◆ Sam's Club Rollout

- DeSoto, Texas DC.....Full rollout 2010
- Pallet Level
 - Lowered the per pallet charge for non-compliance to \$0.12 per pallet
 - In cases of non-compliance, Sam's prints and applies the RFID tag at the Desoto facility and associated clubs
- Case Level
 - Now optional for suppliers
- Unit Level
 - The new requirement is uncertain

What's Up with the Mandates?

▶ Metro Group

METRO Group

- ◆ Expanding its RFID "Tag It Easy!" to China & India

▶ Department of Defense



- ◆ Continuing rollout

▶ Best Buy



- ◆ Discontinued RFID program

▶ Pedigree

- ◆ California Pedigree compliance date 2011



State of the RFID Industry

▶ UHF – GEN 2

◆ CPG companies pulling back

- P&G discontinuing tagging of promotions
- “Slap & Ship” on an exception basis

◆ RFID suppliers holding tight

- Driven by minimal activity in GEN 2 market

▶ RFID technology coming under more scrutiny.....Big Brother?

◆ Expect more legislation

State of the RFID Industry

- ▶ **RFID market expected to grow by 5%**
 - ◆ **APR research**
- ▶ **Hot RFID applications!**
 - ◆ **Apparel, Library**
 - ◆ **Government (ID Cards, etc)**
 - **Providing the growth in RFID market**
 - ◆ **Aerospace, Defense, Healthcare – Asset Tracking**

State of the RFID Industry

▶ EPC Global – Major Changes



- ◆ Looking to Increase Enrollment
 - Small and midsize U.S. businesses
- ◆ Reducing its enrollment and subscription fees
 - Enrollment fees reduced 60%
- ◆ Offering additional services
 - Advisory Services
- ◆ EPCglobal US is also organizing special interest programs
 - Allow businesses to collaborate and develop RFID-enabled business processes, best practices or pilots to test the technology

RFID In the News....

▶ Study by the Reusable Packing Association (RPA)

REUSABLE PACKAGING
ASSOCIATION
Formerly the RPCC

www.choosereusables.com

◆ Participants include

- Wal-Mart, Frontera Produce, Avery Dennison, The Kennedy Group, Alien, UPM, ORBIS, and others

◆ Extensive RFID tag field testing

- Extreme temperature and more than 1,000 miles transportation distance
- Different tag vendors

◆ Key Finding

- “RFID tags designed for single use can be used for multiple trips without any deterioration in performance if positioned correctly on reusable containers.”



RFID In the News.....

- ▶ **Food Traceability -**
 - ◆ **Interest in using RFID for Food Safety is very high**
 - ◆ **RFID Tags Available to Track Temperature & Humidity**



RFID Technology Advances

▶ RFID Tags

- ◆ Vendors proving “Customizable” solutions
 - Custom labels and programming
- ◆ Ruggedized & Hardened
 - Freezer applications
 - Oven/high temperature
 - GPS tags
- ◆ Work mounted directly on metal
- ◆ Cost are declining.....maybe!



Nail Tag



DogBone Tag
(rated for -40 deg F)

2005 - UHF Inlay = \$0.21
2008 - UHF Inlay = \$0.129
2009 - UHF Inlay = \$0.07

RFID Technology Advances

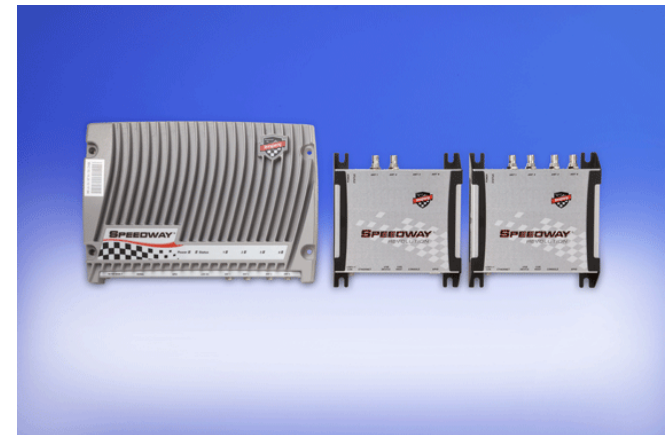
▶ ThingMagic Vega Reader

- ◆ Design for vehicle mounting
- ◆ Ruggedized – indoor/outdoor
- ◆ Low power consumption



▶ Impinj Speedway Revolution Reader

- ◆ Autopilot technology
 - Continuously and automatically optimizes the reader for its operating environment to deliver peak performance at all times



RFID Technology Advances

- ▶ **Merging of frequency**
 - ◆ **Vendors combining technologies & frequencies**
 - **Offering passive and active**
 - ◆ **Aeroscout, Savi**

RFID In Action - Distribution

▶ Walgreens deployed an RFID system

Walgreens

- ◆ New distribution system
- ◆ 170,000 totes, 45 shipping doors and serves over 700 stores, 80,000 cases daily
- ◆ RFID Tagged Totes – Items associated to totes
- ◆ System verifies the correct tote, item quantities, dock door/truck and proper loading schedule
- ◆ Used to identify mis-shipments

RFID In Action – Process & Assembly Tracking

- ▶ **Assembly tracking for industrial manufacturing**

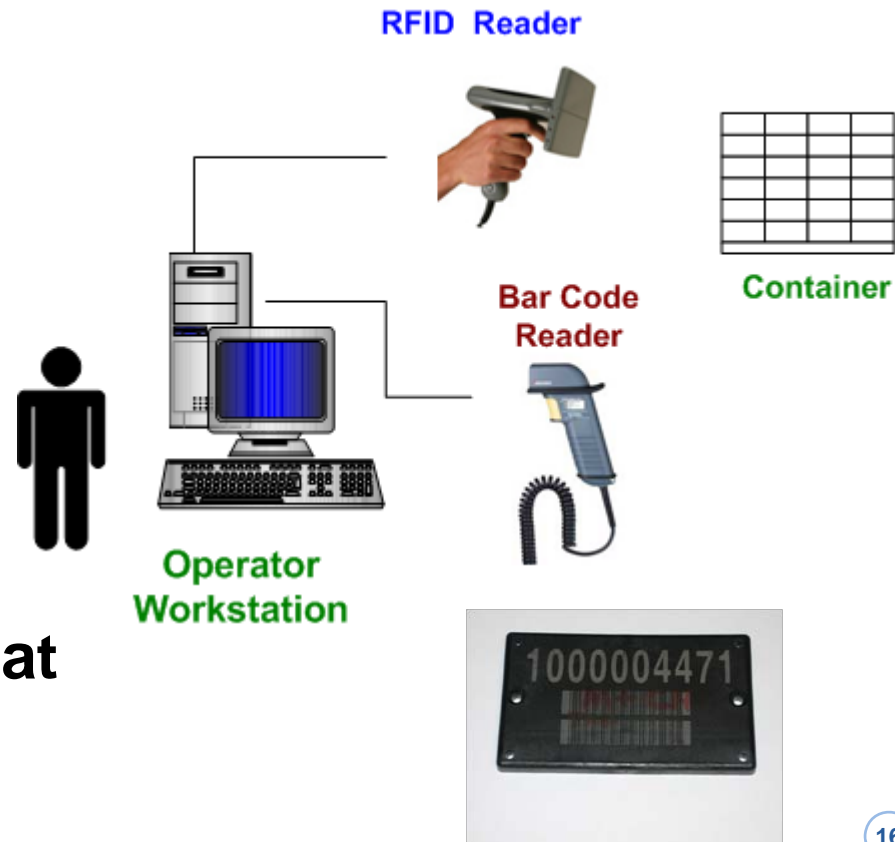


- ▶ **Tracking using RFID:**

- Engine carts
- Containers
- Baskets
- Totes

- ▶ **Using passive RFID**

- EPC GEN II – GID format
- Different tag types

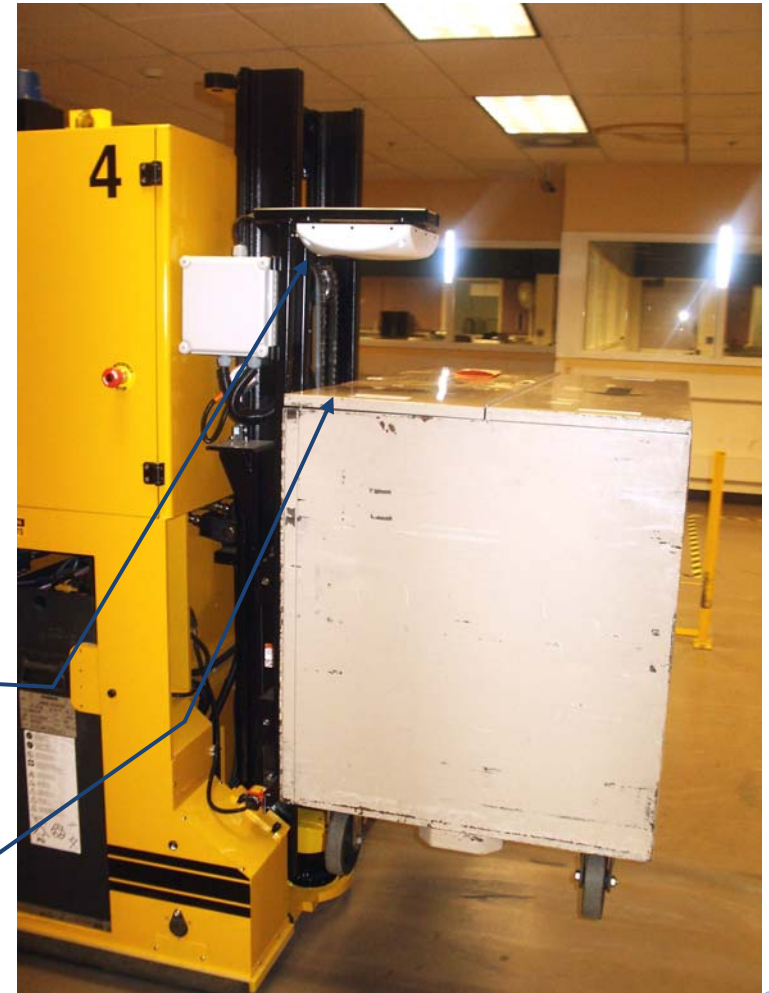


RFID In Action – Container Tracking

- ▶ **Container tracking**
- ▶ **RFID reader mounted on AGV**
 - ◆ **RS232 connection to AGV controller**
- ▶ **Using passive RFID**

Reader Mounted
on AGV

RFID Tag
Mounted on Top
of Load



Maintaining an RFID System

- ▶ **RFID systems require very little housekeeping**

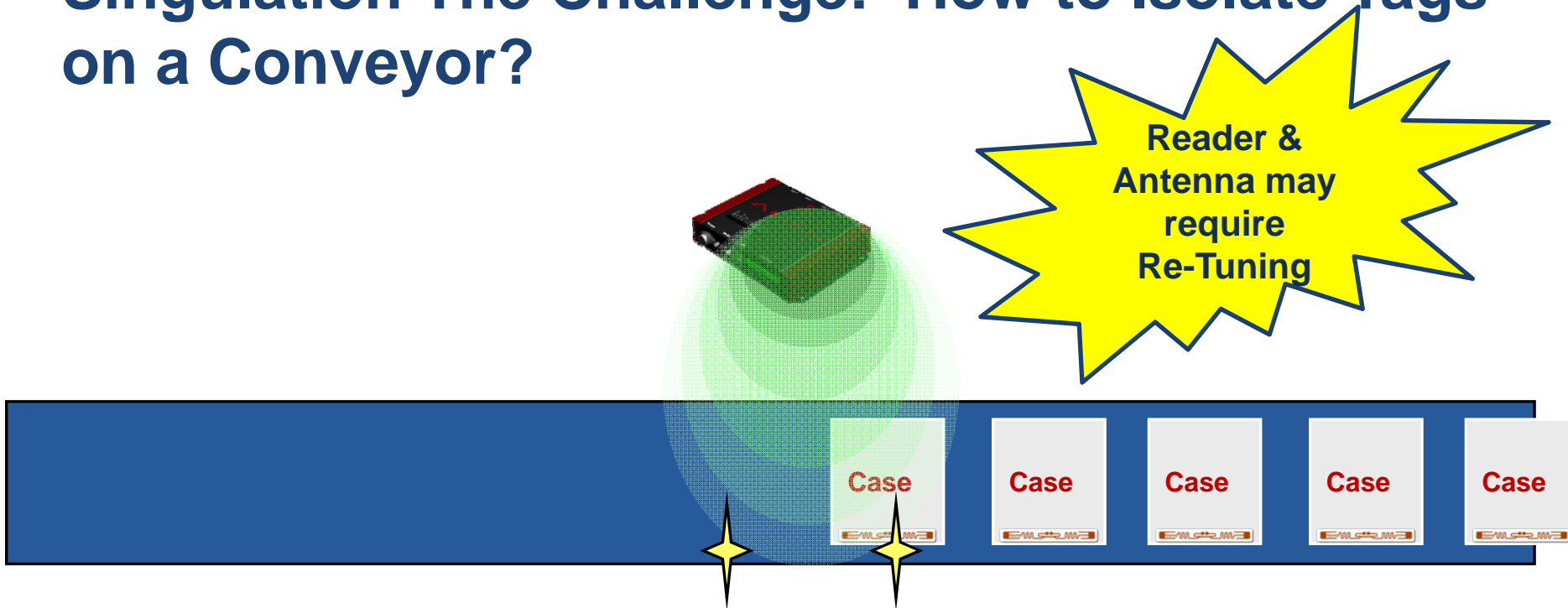
....Provided Nothing Changes!

- ▶ **UHF GEN II tags change**
 - ◆ **RFID tag's chip get upgraded**
 - ◆ **More sensitive, faster, more data**
 - ◆ **Typically better performance**
 - ◆ **Longer read range is good, right?**



Maintaining an RFID System

Singulation The Challenge: How to Isolate Tags on a Conveyor?



Wide aperture antenna cannot discern packed tags

New Applications in RFID – KISS for Data Integration



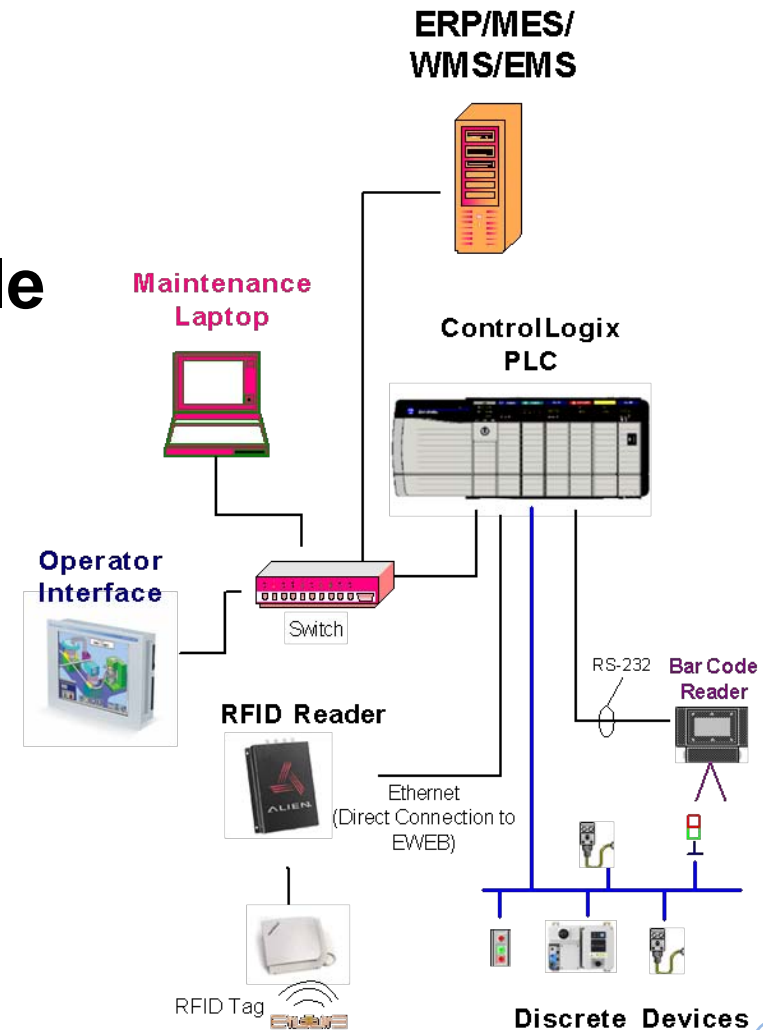
- ▶ **Emphasis on keeping data integration simple**
 - **Direct drivers to readers**
 - **Interface to PLC's**
 - **API's and DLE's available from vendors**
- ▶ **Advantages of KISS**
 - **Eliminate RFID middleware**
 - **Hardened industrial solution**
 - **Limit modifications to existing MES/ERP & WMS**
 - **Solves the maintenance issue**

New Applications in RFID – KISS for Data Integration



► ControlLogix PLC

- ◆ ControlLogix PLC
- ◆ 1756-ENBT ethernet module
- ◆ 1756-EWEB module
 - WEB service module
 - Socket services
 - Uses structured text programming



New Applications in RFID – RFID Enabled Fork Truck

▶ RFID Enabled Fork Truck

- Automatically scan inventory
- Automatically determine location

▶ Benefits

- Eliminate manual bar code scanning
- Gain 100% inventory accuracy
- Reduce or eliminate cycle counting
- Reduce the size of your lift truck fleet
- Reduce maintenance costs



*The RFID
Holy Grail in
Material Handling!*



New Applications in RFID – RFID Enabled Fork Truck

► Solution Details

- RFID readers mounted on fork truck
- RFID tags at rack location
- Optional fork truck position detection
 - RTLS
 - Optical positioning



New Applications in RFID – RFID Enabled Fork Truck

► Solution details

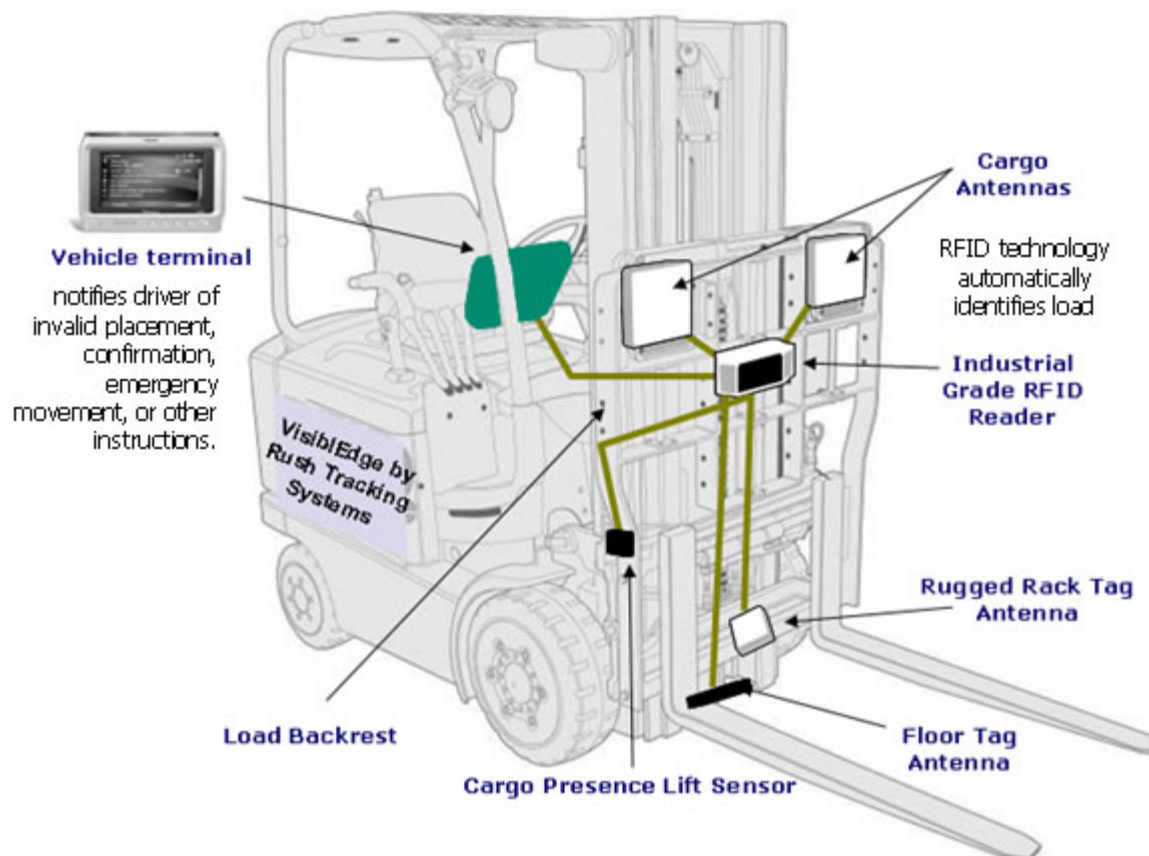
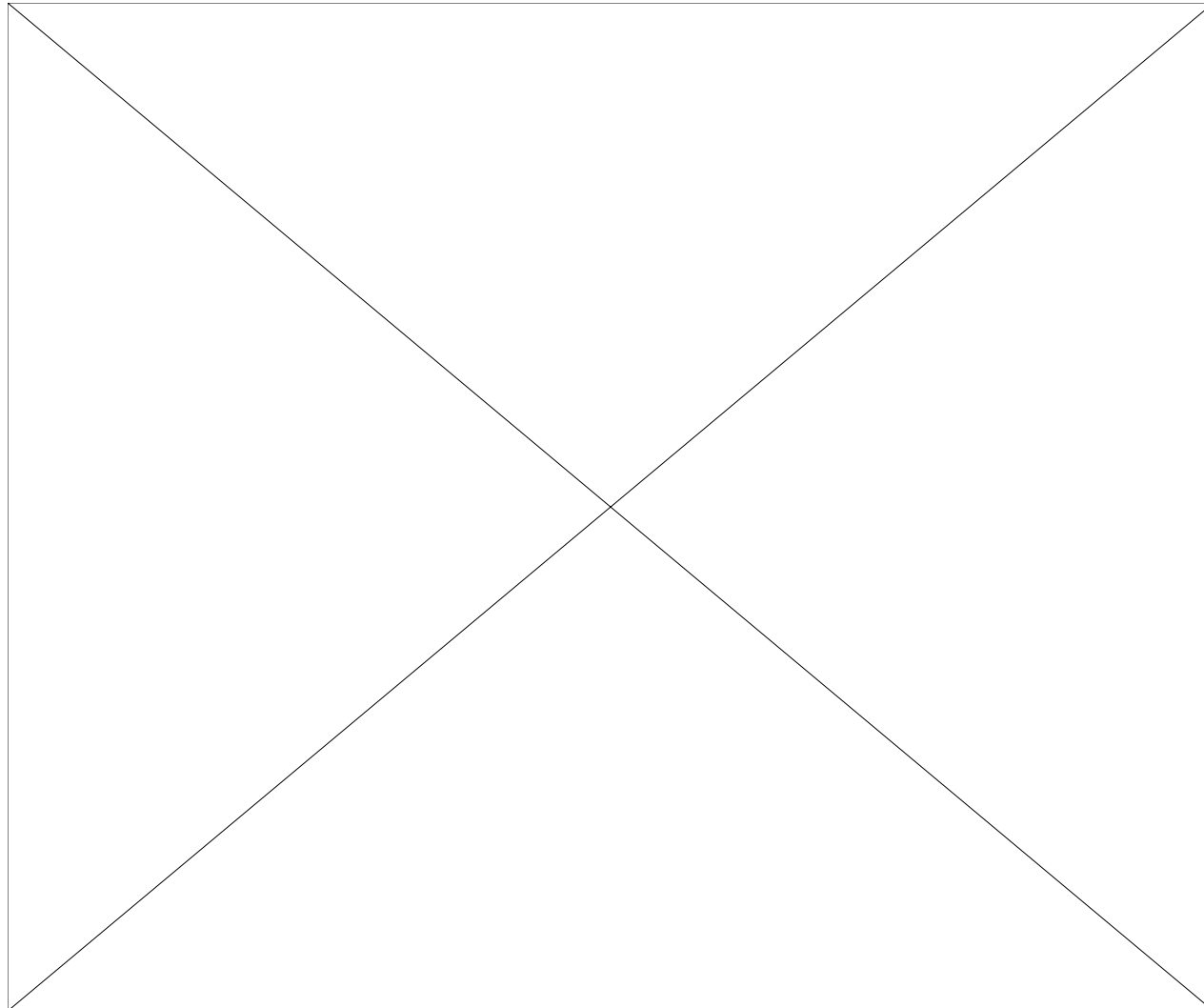


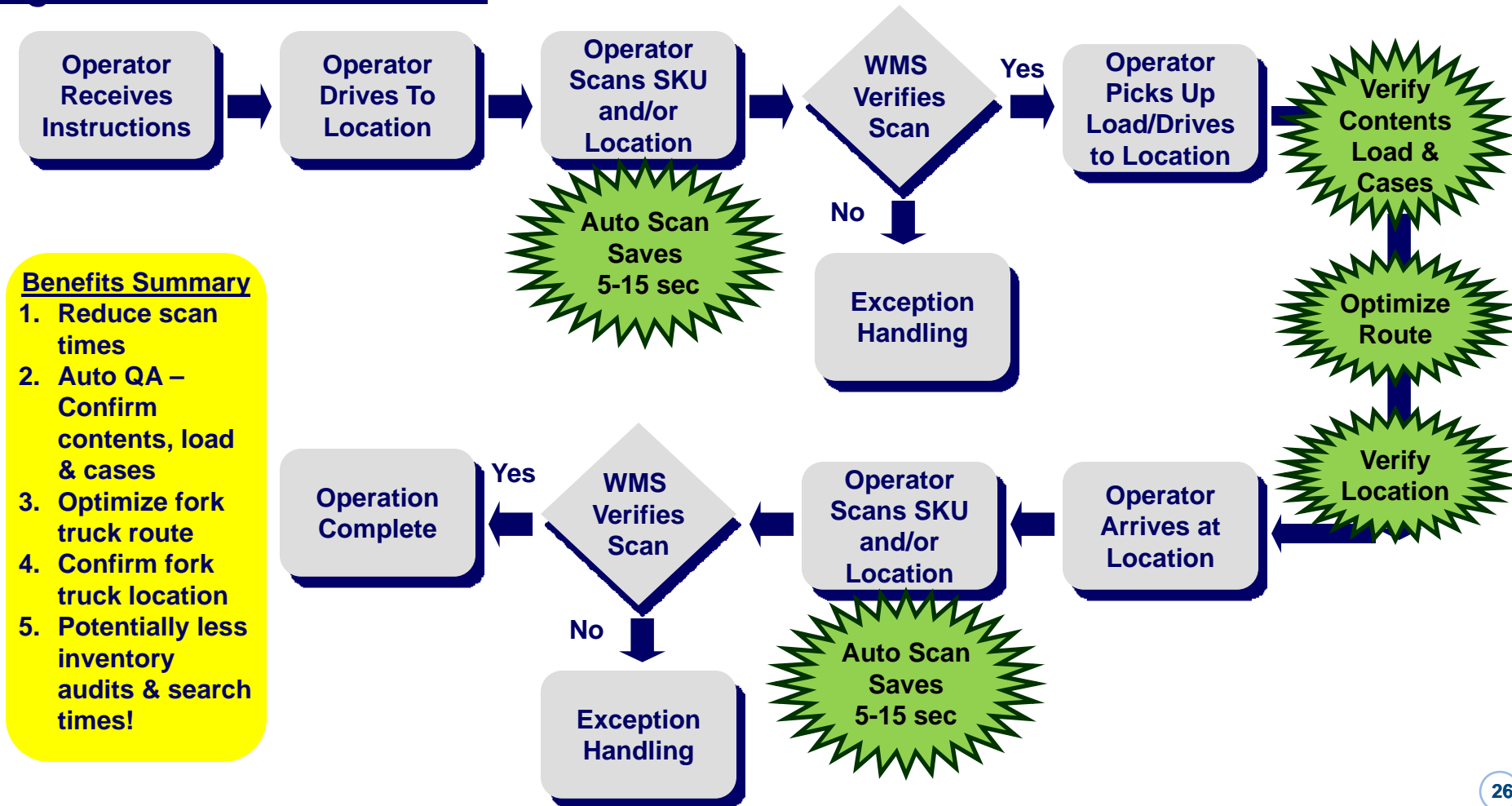
Photo courtesy of Rush Tracking Systems

New Applications in RFID – RFID Enabled Fork Truck



New Applications in RFID – RFID Enabled Fork Truck

High Level Process Flow



New Applications in RFID – RFID Enabled Fork Truck

► Challenges in acquiring the Holy Grail!



◆ Accuracy

- Metal...Lots of it!
- Am I really reading that pallet?

◆ Maintenance & complexity

◆ RFID Tagging – Rack/Loads/Floor

◆ System cost

- If I'm already 99.xxx% accurate...ROI?

◆ Impact on WMS/ERP



Key Takeaways

- ▶ **RFID adoption rate is steadily increasing**
- ▶ **Focus on the business case and driving value**
- ▶ **The RFID market is maturing:**
 - ◆ **Costs are falling**
 - ◆ **Capabilities are increasing**
 - ◆ **ROI is becoming more common**
 - ◆ **Standards are being strengthened**

How can I learn More about RFID?

▶ Supply Chain Digest

- ◆ www.supplychaindigest.com

▶ RFID Journal Update

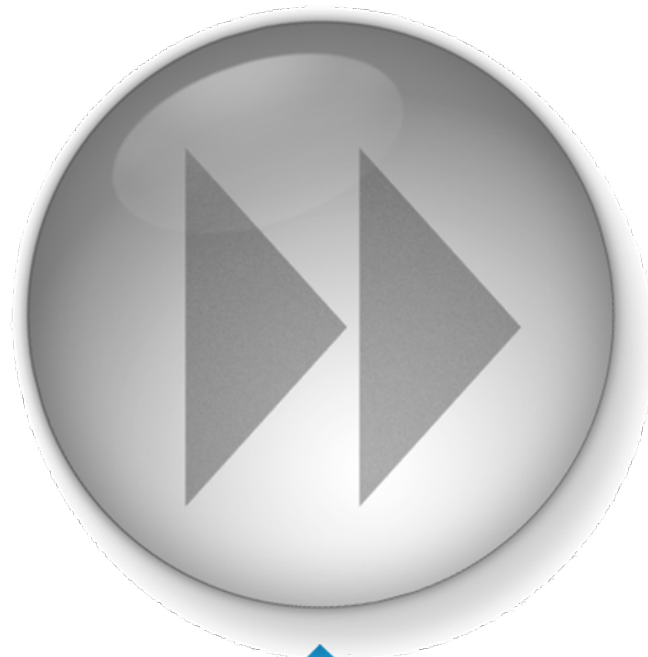
- ◆ RFID Update is the RFID industry daily newsletter
- ◆ www.rfidupdate.com

▶ Baird Supply Chain Technology

- ◆ RFID Monthly Report
- ◆ Reik Reid, rread@rwbaird.com

▶ RFID Switchboard

- ◆ www.rfidsb.com



material handling  **logistics conference**
SPONSORED BY HK SYSTEMS

Questions?