CEPM

Webinar #3 – Component Registration and Reporting Component Application

Jeff Wall

CEPM Sr Business Analyst

Railinc

ASSOCIATION OF AMERICAN RAILROADS

Introduction to CEPM-Wheelset Registration and Association

This session will cover basic information about CEPM-Wheelsets and how you can begin registering and associating components through CEPM-enhanced systems.

Thursday, November 10th, 2011

2 p.m. to 3:30 p.m. (ET)

Recommended for Shops, Manufacturers and software providers

"CEPM"
Comprehensive
Equipment Performance
Monitoring

Information Online – www.railinc.com/cepm

Railinc Corporation | CEPM Project - Microsoft Internet Explorer provided by Railinc

https://www.railinc.com/cepm

RAILINC

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- CEPM Events
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Early Warning

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CEPM Program Overview

The Comprehensive Equipment Performance Monitoring (CEPM) program is a multi-phase, multi-year initiative to create a rail industry process and related technology tools for capturing data around railcar equipment components. CEPM will help railroads, rail equipment owners, repair and wheel shops, and other industry participants have a complete view of rail equipment health and performance. This will enable managers to make decisions that improve rail safety, lower the cost associated with equipment maintenance, and run more efficient and effective rail operations.

The program's first phase—CEPM-Wheelsets—centralizes the registration of wheelset component details and identifies the application of wheelset components, including AAR and non-AAR repairs. The component-level data created through the CEPM program will be available through Railinc's Umler™

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Greater visibility. Better tracking. Learn more here.

REFERENCE FILES
FindUs.Rail
Quickly find critical contacts from across the rail industry.

CEPM Component Tracking Objectives

- Support Recall of Components identified with safety issues

- Support equipment owners with details of components on their equipment

- Capability to track performance of components related to component life, failure rates, and history of the component.

Industry Requirements

- Establish <u>industry rules</u> for reporting component details and application to equipment

- Develop a <u>re-usable framework</u> that can support a list of priorities for tracking wheelsets, castings, valves, PTC, GPS devices, brakes, cushioning, traction motors, etc.

- Maintain <u>Confidentiality</u> of reported data

- Support <u>Bar Code</u> and RFID standards

CEPM-Wheelsets Process Flow
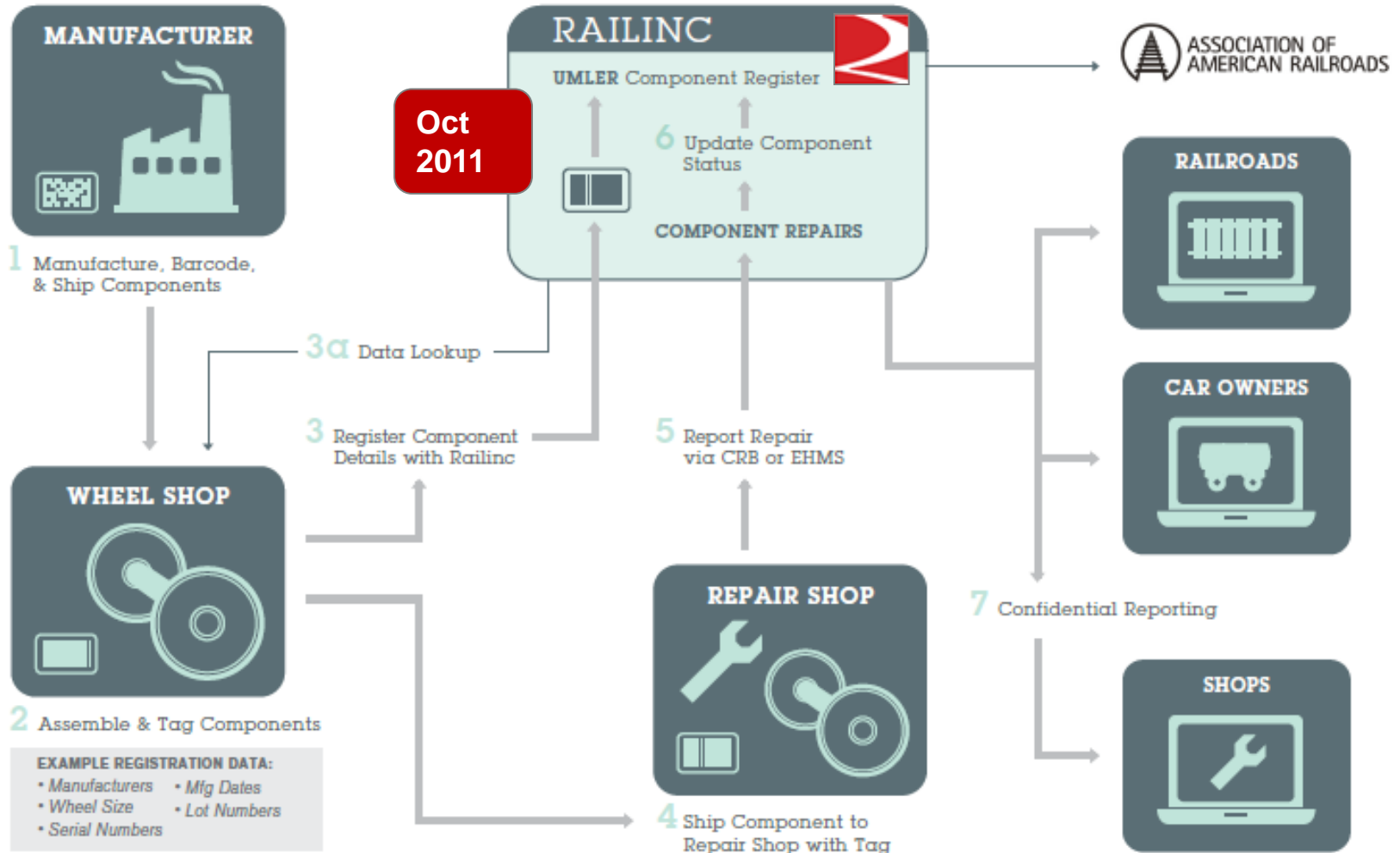
Manufacturers – Keys to Success

Manufacturers of Wheels, Axles, and Bearings will be responsible for accurate barcoding that includes necessary data to support Wheel Shop reporting requirements.

Key Documents;

- AAR CEPM Bar Coding Specification (Wheelsets)
  - What the OEM 2D bar code should look like
- Wheelset Data Glossary
  - Data Elements that need to be reported
- Reference File
  - Permissible Values

Bar Codes, RFID primer

BarCode: 1D BarCode

ABCD1234567890 =

Used for AAR Component Identification, Little Data

BarCode: 2D BarCode or Bar Code Matrix

ABCD1234567890 =

Used for Carrying much data, with redundancy

RFID: Example: AEI

Used for Carrying much data, wireless/remote

Costs, Equipment/Reliability, Longevity – Wheelsets: Survive until application

Manufacturers – Bar Coding Specification

MANUFACTURER

AAR| Manual of Standards and Recommended Practices

S-XXX   SEGMENT 1.0

1   AAR Component Identification (CID) Bar Code Specifications

2   Specification M-XXX
3   Adopted: XXX 1, 2011

4   Purpose and Scope

5   The purpose of this specification is to establish an industry standard for the AAR
     Component Identification Bar Code.

6   This standard defines the method and content of bar code labels on components to be
     tracked within the AAR systems. This will better support the management,
     administration and maintenance of railroad equipment assets by providing
     traceability of component performance throughout their life cycle.

Thomas J. Stahura
Executive Director, Rules and Standards

ASSOCIATION OF AMERICAN RAILROADS

Thursday, August 25, 2011

C-11496

Circular Letter

Subject:**SOLICITATION FOR COMMENTS – Comprehensive Equipment Performance Monitoring (CEPM) Standards**

To:**MEMBERS AND PRIVATE CAR OWNERS**   File Number:ATSI & EHMS SC

This Circular Letter is soliciting comments to the proposed Comprehensive Equipment Performance Monitoring (CEPM) Standards.

The Association of American Railroads (AAR) Comprehensive Equipment Performance Monitoring (CEPM) task force (sponsored by ATSI), in conjunction with the Wheels, Axles, Bearings, and Lubrication (WABL) Committee invite your review of the following documents that pertain to the newly developed bar-coding standard and the data definitions that support the electronic tracking of wheel sets.   This request is being done in anticipation of the January 2012 implementation that will require component manufacturers to label wheels, axles and bearings for use in the AAR system.

There is an overview of the entire component tracking project at Railinc.com/CEPM. That overview contains proposed timelines and additional background.

One attachment is for the bar code standard. The other attachment details the data that will be required.

Comments from interested parties are herewith solicited under the provisions of AAR Standard S-050. Please submit any comments or questions to Ken Rownd, Manager, WABL Committee at TTCI.
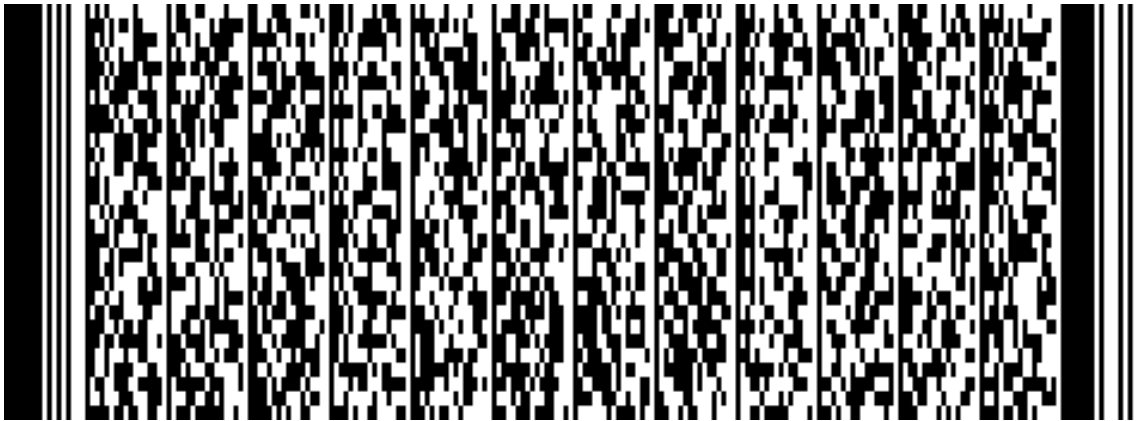
Mr. Rownd's email address is ken_rownd@aar.com.

All comments received by October 15, 2011 (extended comment period) will be considered by the WABL Committee prior to final action on the proposed revisions.

Sincerely,
Thomas J. Stahura
Executive Director, Rules and Standards
202-639-2139 202-639-2930 Email:tstahura@aar.org
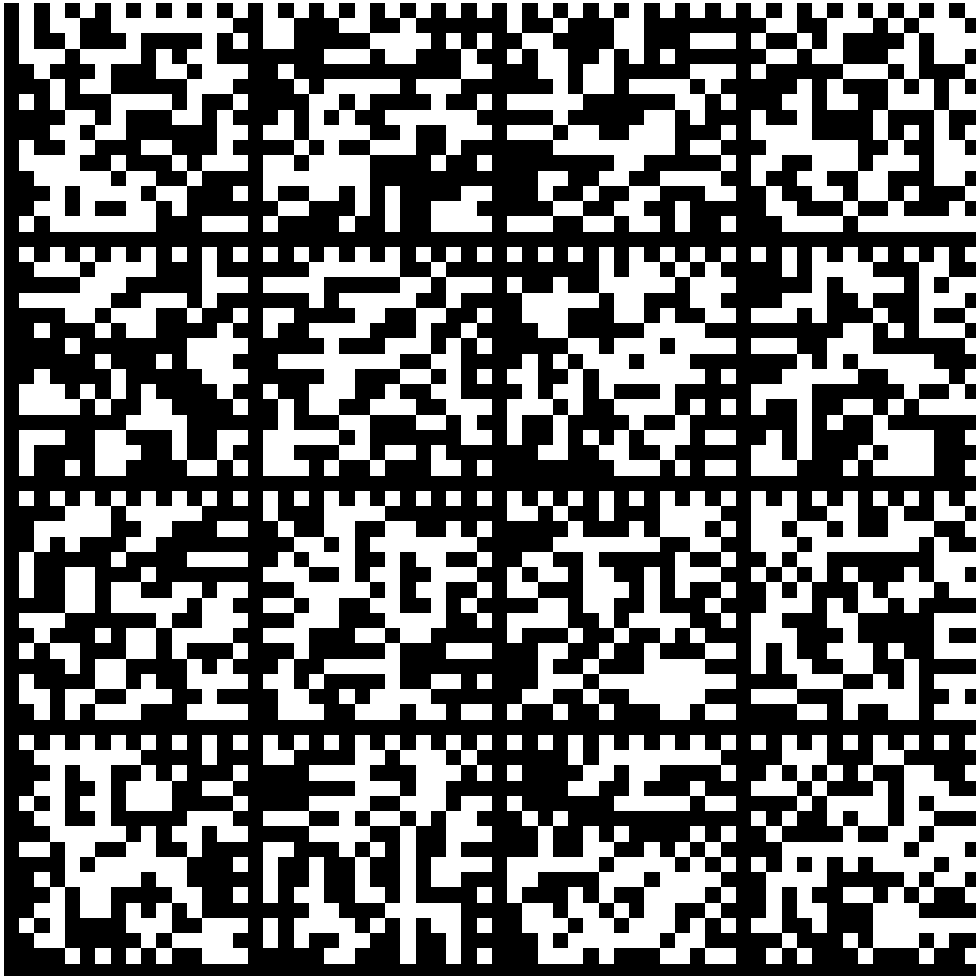
PDF417

1100 byte capacity
Widely used
- Airlines
- Postal Service
- Inventory Mgmt

"Portable Data File"

Data Matrix Bar Codes

1500 byte capacity
Widely used in tracking
of components in the
aerospace industry

Matrix of light and dark
Squares

Bar Coding Vendors

ACCU-SORT Systems, Inc.	www.accusort.com	
Indigina	www.indigina.com	972-725-9309
Barcode ID Systems	www.barcodeid.com	
Zebra	www.zebra.com	
Wheel Shop Automation	www.wheelshopautomation.com	877-834-9540

Manufacturers – Bar Coding Specification


```
<Wheel>
<C101></C101>
<C102></C102>
<C103>GRFI</C103 >
<C104>2/1/2011  18:55:12</C104 >
<C105>11</C105 >
<C106>01</C106 >
<C107>GK</C107 >
<C108>D</C108 >
<C109>22</C109 >
<C110>0</C110 >
<C111>1231</C111 >
<C112>1234abcd</C112 >
<C113>36</C113 >
<C114>CH</C114 >
<C115>CrvS</C115 >
<C116>241.25</C116 >
<C117>N</C117 >
<C118>AMST1234</C118>
</Wheel>
```

WHEEL   NEW
GK 123456 11 / 01
CH 36   D   241.25
Rim / Finger : 22 / 0
Plate: CrvS
Facility: GRFI
Heat: 1234ABCD
Date: 2/1/11 18:55:12
Railroad Wheel Corp

Decoding the Data in the Bar Code

The Data Glossary describes the data, who is required to report the information, and which barcode the data should be reported on.

CSV Heading	Element ID		What is this?	Sample(s)	On What?	Field by Wheel shop	Wheel shop by Wheel OEM	Wheel shop by Bearing OEM	Wheel shop by Bearing Recondition	Wheel shop by Axle Manufacturer		by Wheel OEM	by Bearing OEM
WHEEL:1-C112	C112	Wheel Heat/Melt	Wheel(1) Heat/Melt	1234abcd	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C113	C113	Wheel Nominal Diameter	Wheel(1) Nom Diam	36	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C114	C114	Wheel Design Code	Wheel(1) Design Code	CH	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C115	C115	Wheel Plate Type	Wheel(1) Plate	StrPl, CrvS, CrvParab	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C116	C116	Wheel Tape Size	Wheel(1) Tape	241.25	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C117	C117	Wheel New or	Wheel(1) New/Turn	N	Wheel OEM		Yes				Yes	Yes	

The Reference File lists permissible values

For some data, the information must be recorded <u>exactly</u> as defined in the reference files. Incorrect data on a barcode will effect the value of barcoding for customers.

ELEMENT_DEFINITION_SQN	ELEMENT_ID	ELEMENT_NAME	DESCRIPTION
10	C003	Component AAR Facility Code	4-letter code uniquely identifying the facility whe
20	C004	Component Assembly Timestamp	Date/time when wheelset assembly is finalized at the
25	C005	Extended Wheelset Codes	These are internal codes, but designed to be included
30	C006	Component Vendor Shipment Information	Optional. For use by component manufacturer/assem
60	C103	Wheel AAR Facility Code	Up to 4 character "QA Facility Code" maintained by A
70	C104	Wheel Manufactured Timestamp	Date that identifies the month, day, year and time of
80	C105	Wheel Stamped Year	Wheel stamped year from manufacture. Physically s
90	C106	Wheel Stamped Month	Wheel stamped month from manufacture. Physically
100	C107	Wheel Stamped Manufacturer Code	1 (prior to 3-78) or 2-letter code that identifies the man
110	C108	Wheel Stamped Class	The stamped wheel material class: A,B,C,D, U. Also
120	C109	Wheel Rim Thickness Side Scale Readi	2-digit number reporting the measured thickness of th
130	C110	Wheel Finger Gauge Reading	2-digit number reporting the flange thickness using St
140	C111	Wheel Stamped Serial Number	Serial number stamped into or cast on the wheel.
150	C112	Wheel Heat/Melt	Up to 8 digits or characters according to manufacture
160	C113	Wheel Nominal Diameter	2-character wheel diameter size, based on Wheel De

Element_Definitions / Element_Valid_Values

ELEMENT_VALID_VALUES_SQN	ELEMENT_DEFINITION_ID	VALID_VALUE	VALID_VALUE_LABEL	SORT_ORDER	I
1360	110	B	Heat Treated Wheels	1	
1370	110	C	Heat Treated Wheels	2	
1380	110	D	Alloy Wheels	3	
1390	110	U	Non-Heat Treated or Unmarked	4	
1400	160	28	28 inch wheel	1	
1410	160	30	30 inch wheel	2	
1420	160	33	33 inch wheel	3	
1430	160	36	36 inch wheel	4	
1440	160	38	38 inch wheel	5	
1450	170	A	A Wheel Design Designation	1	

Element_Definitions / Element_Valid_Values

Wheel, Axle and Bearing OEM 2D Bar Codes

WHEEL   NEW
GK 123456 11 / 01
CH 36   D   241.25

Rim / Finger : 22 / 0
Plate: CrvS
Facility: GRFI
Heat: 1234ABCD
Date: 2/1/11 18:55:12

Railroad Wheel Corp

AXLE   6.5 x 12   F+

SN / Heat: 123123 ABCDEF
Type: RWS
Class: 7
Condition: 2
Facility: GRFI
Converter: ABCD
Plating: AXIS1234
Conv Date: 6/1/11 18:55:12
Mfg Date: 2/1/11 18:55:12

Railroad Axle Corp

BEARING   NEW
12345678   6.5 x 12
11 / 01   GG

Facility: TRBC
Seal: HDL
Cert: 01A
Ring: SureFit
Cage   STD
Grease: 3201
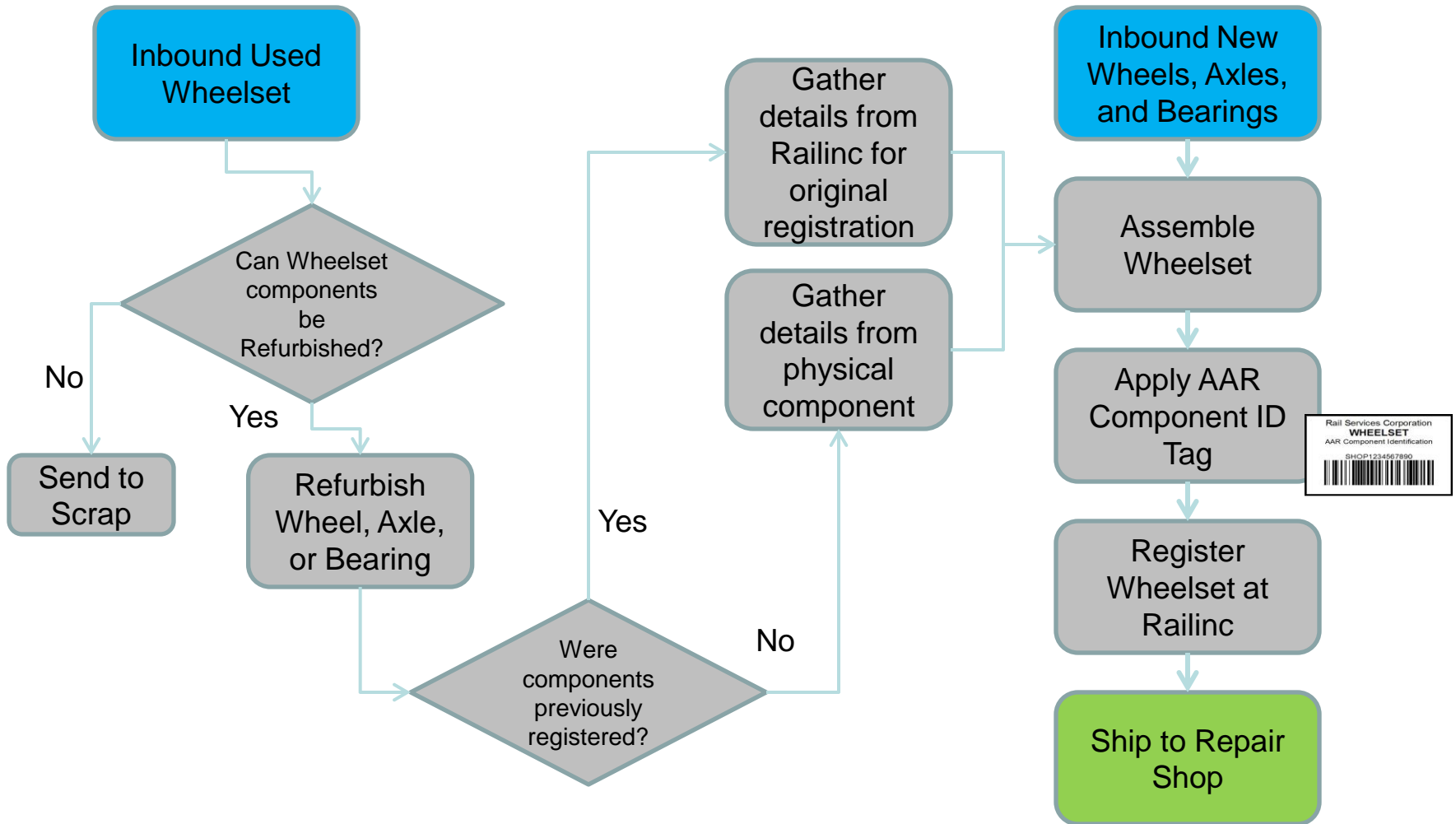Date: 2/1/11 18:55:12

Railroad Bearing Corp

MANUFACTURER

2D Barcodes are dynamic

Manufacturers will require bar code printers since the data on the bar code sticker is dynamic.

Serial numbers, dates, design specs all need to be printed in the code and in most cases human readable forms.

CEPM-Wheelsets Process Flow
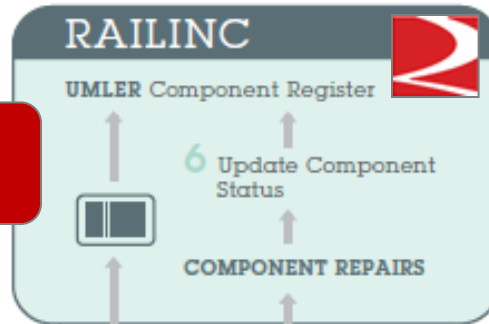
Wheelset Assembly

Wheel Shops – Keys to Success

Assemblers of Wheelsets will be responsible for accurate collection of bar code data from wheels, axles, and bearings.

They will associate that data to a pre-printed 1D barcode that is applied to the assembled wheelset.

The complete wheelset data will be sent to Railinc and constitutes the Wheelset Registration.

Key Documents;

- AAR CEPM Bar Coding Specification (Wheelsets)
  - Read the OEM 2D bar code for each wheel, axle, & bearing
  - Creation of 1D bar code for the wheelset
- Wheelset Data Glossary
  - Data Elements that need to be reported
- Reference File
  - Permissible Values

Wheel, Axle and Bearing OEM 2D Bar Codes

WHEEL   NEW
GK 123456 11 / 01
CH 36   D   241.25

Rim / Finger : 22 / 0
Plate: CrvS
Facility: GRFI
Heat: 1234ABCD
Date: 2/1/11 18:55:12

Railroad Wheel Corp

AXLE 6.5 x 12   F+

SN / Heat: 123123 ABCDEF
Type: RWS
Class: 7
Condition: 2
Facility: GRFI
Converter: ABCD
Plating: AXIS1234
Conv Date: 6/1/11 18:55:12
Mfg Date: 2/1/11 18:55:12

Railroad Axle Corp

BEARING   NEW
12345678   6.5 x 12
11 / 01   GG
Facility: TRBC
Seal: HDL
Cert: 01A
Ring: SureFit
Cage   STD
Grease: 3201
Date: 2/1/11 18:55:12
Railroad Bearing Corp

WHEEL SHOP

Wheel Shops – Bar Coding Specification

<Wheel>
<C101></C101>
<C102></C102>
<C103>GRFI</C103 >
<C104>2/1/2011 18:55:12</C104 >
<C105>11</C105 >
<C106>01</C106 >
<C107>GK</C107 >
<C108>D</C108 >
<C109>22</C109 >
<C110>0</C110 >
<C111>1231</C111 >
<C112>1234abcd</C112 >
<C113>36</C113 >
<C114>CH</C114 >
<C115>CrvS</C115 >
<C116>241.25</C116 >
<C117>N</C117 >
<C118>AMST1234</C118>
</Wheel>

WHEEL   NEW
GK 123456 11 / 01
CH 36   D   241.25

Rim / Finger : 22 / 0
Plate: CrvS
Facility: GRFI
Heat: 1234ABCD
Date: 2/1/11 18:55:12

Railroad Wheel Corp

Wheel Shop Process

Inbound Used Wheelset

Can Wheelset components be Refurbished?

No → Send to Scrap

Yes → Refurbish Wheel, Axle, or Bearing

Were components previously registered?

Yes → Gather details from Railinc for original registration

No → Gather details from physical component

Gather details from Railinc for original registration → Assemble Wheelset

Gather details from physical component → Assemble Wheelset

Inbound New Wheels, Axles, and Bearings → Assemble Wheelset

Assemble Wheelset → Apply AAR Component ID Tag → Register Wheelset at Railinc → Ship to Repair Shop

Rail Services Corporation
WHEELSET
AAR Component Identification
SHOP1234567890

Code 128

Rail Services Corporation
WHEELSET
AAR Component ID
SHOP1234567890

Variable Length
Commonly used for
shipping and packaging
industry

Readable by almost
any bar code reader

Includes a Check Digit

1D Barcode can be pre-printed

Wheel Shops can preprint barcodes since the data is serialized.
This also enables centralized management of the codes for multiple location wheel shops.

Prerequisites to Component Registration

1. Contact Railinc

   - Get a Company ID

   - Register for an SSO User ID

2. Read the User Guide and Specifications to understand the requirements for reporting

3. Request Access to Umler from your Umler Company Administrator (that may be you)

4. Request Component Maintenance Access from your Umler Company Administrator

5. Determine how AAR Component IDs will be managed by your company

Wheelset Registration with Railinc

Companies have two ways to register a wheelset

Railinc.com

- Input one wheelset at a time
- Upload CSV

XML via Web Services – Real time transactional integration

Web Service will allow Wheel Shops to automate reporting of information through their own systems

Comp Registration via the railinc.com website
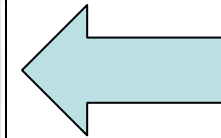
Login with your SSO User ID

Login to the Umler system

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Select Registration from the Component Registry Menu

RAILINC | Umler

RTSOLIS : RAIL - RAILINC C

| Home | Query | Maintenance | Upload / Download | Railinc Admin Functions | Account Administration | Contact List | **Component Registry** | Help | Re |

Registration
Associate Component

Welcome to Umler - Umler Equipment Management Information System

The **Umler** Equipment Management Information System is a mission-critical Rail Industry database and suite of applications that store and communicate data pertaining to the massive inventory of railway equipment used by the industry. The physical characteristics and restrictions of equipment, status and management information that are contained in Umler ® are critical to the industry.

The communication of rail equipment data provides for the safe movement of traffic, smooth interchange of traffic between carriers and means to provide rail customers with the right pieces of equipment for their shipment.

Release Notes
Umler User Guide
Umler Data Specification Manual

News and Updates

** Umler 3.6 Release postponed until Wednesday evening Oct 27th **
Train II and Web Service customers need to be advised that reference files for Umler 3.6 release were not implemented Oct 26th.

Oct 26th, 2010 - Umler 3.6 New Features
Railinc release new features and updates in the application on Oct 26th.

• Superstructure Project – Visibility of Superstructure data for a superstructure owner.
• Locomotive data updates and inspection rights for Umler Owners.
• Enable specific updates to data across platforms for drawbar and articulated equipment
• Calculation of Air Brake Test Due Dates now 'exactly 12 months' instead of '1st of month after 12

If the Registration menu is not visible, request "Component Maintenance Access" from your Umler Administrator.

Option #1 - Component Registration Interface

Enter information for each component to register. Good for beginners.

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Option #2 – Upload via CSV

More Efficient way to register components. Refer to the CSV Upload Guide as well as templates that are available.
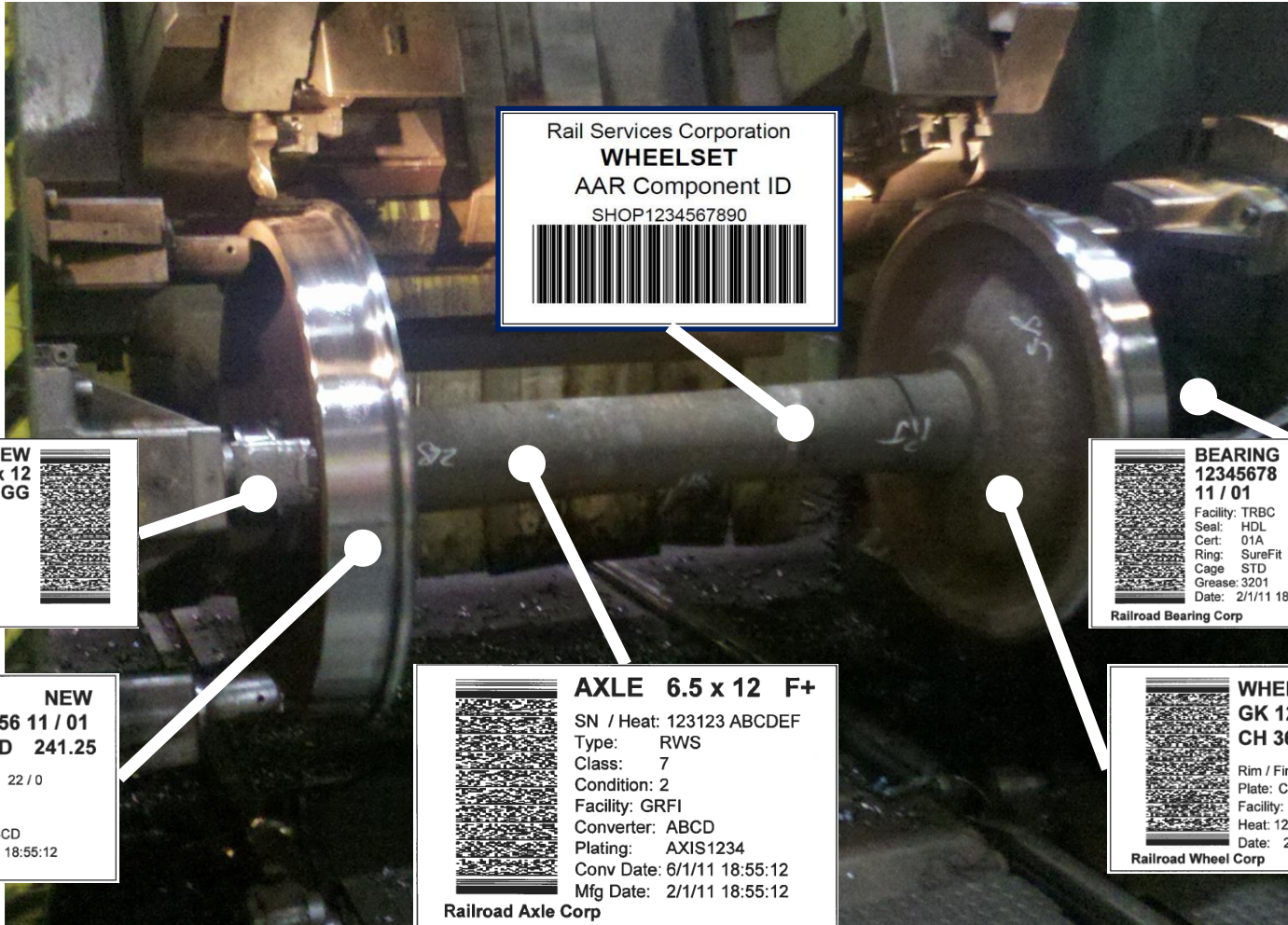
Option #3 – Web Services Integration

If your company is interested in the technical specification for integrating your products with the Umler Component Registry, please contact csc@railinc.com

Railinc can provide WSDLs and technical specifications to get you started.

Wheelset Barcodes

CEPM-Wheelsets Process Flow

MANUFACTURER

Feb 2012

1 Manufacture, Barcode, & Ship Components

RAILINC

UMLER Component Register

Aug 2011

6 Update Component Status

COMPONENT REPAIRS

ASSOCIATION OF AMERICAN RAILROADS

RAILROADS

3a Data Lookup

3 Register Component Details with Railinc

5 Report Repair via CRB or EHMS

WHEEL SHOP

July 2012

2 Assemble & Tag Components

EXAMPLE REGISTRATION DATA:
- Manufacturers
- Wheel Size
- Serial Numbers
- Mfg Dates
- Lot Numbers

REPAIR SHOP

CAR OWNERS

7 Confidential Reporting

SHOPS

4 Ship Component to Repair Shop with Tag

CEPM Systems to report association

Umler

Component Registry – Components can be registered, as well as associated to equipment

- Car Builders can use a CSV upload process to associate batches of components to Equipment

- Car Builders can also use Web Services to associate components to Equipment

CRB – Changes to include AAR Component ID with reporting (Pos 327-340)

EHMS - Changes to include AAR Component ID with Alert Closure reporting

Railinc recommends the use of CRB for Shops

Railinc work over the next few years will emphasize the Use of CRB for;

Reporting Inspections

Closing Alerts

Associating future Components

DDCT workflow

Association Snapshot

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BRC

BRC Job Couplet

Car: NS 200000	**Repair Date:** 12-01-2010	**Repaired At:** 412750000
Total Charge: 2208.71	**Status:** Priced	
Invoice Number: Not Invoiced	**Invoice Date:** Not Invoiced	

Repair Information

Location on Car: Z	**Quantity [PM Max: 1] :** 1.0	**Condition Code:** 1
Applied Job Code: 3328	**Applied Qualifier:**	**Why Made Code:** 09
Component ID: RAIL1234567890		
Removed Job Code: 3328	**Removed Qualifier:**	**Responsibility Code:** 1

Applied Job Code Description: NEW WHEEL SET 28 INCH, 6 X 11 AXLE

Narrative: NEW WHEEL SET 28 INCH, 6 X 11 AXLE

Pricing Information

Material Price: 1864.06	**Labor Price:** 86.56	**Total:** 1950.62

Done   Cancel   Add Next
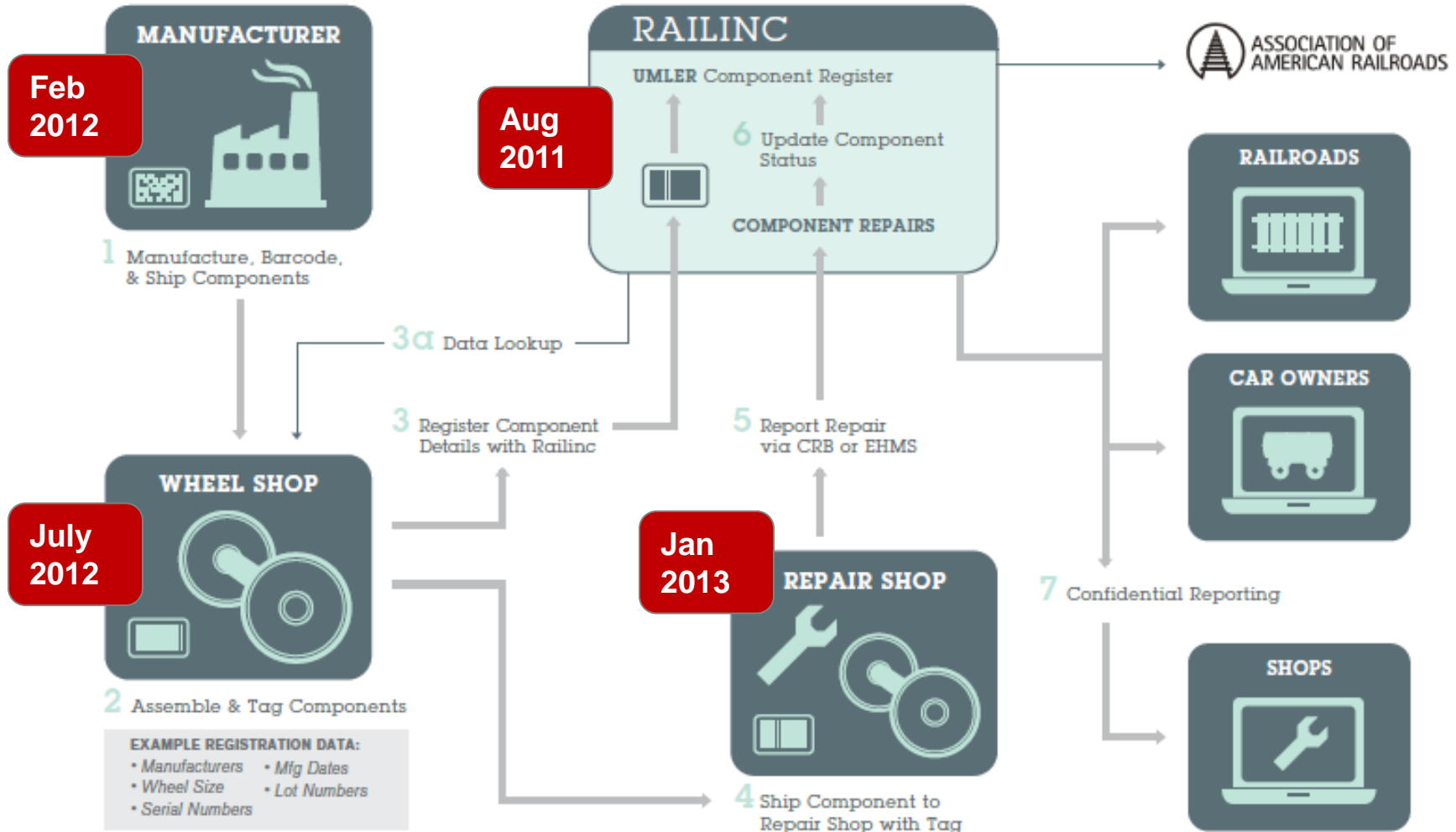
Alert Closure Reporting

Notes:
- Only an inspection can close a THD, TPDG or TPDL alert. Repairs do not close truck alerts.
- An ME inspection will not close an alert.
- Submitting an ABT will generate a billable charge.
- Submitting an ABT requires that the user have proper permissions within the Umler application.
- Component Tag ID should only be entered once per axle location and Equipment ID.

		Equipment		*Closure Made By	Closure Rptd By	*Closure Date	*SPLC
		*Initial	*Number				
1.	☐	▼ RAIL	0000123456	RAIL	RAIL	11-10-2011	123456

	Job Code	Why Made Code	Location	Component Tag Id
◉ Repair ○ Non AAR Repair ○ Inspection	3328		*AXLE 03	RAIL123456

[Add] [Delete] [Save] [Reset] [Clear]

CEPM-Wheelsets Process Flow

CEPM Industry Timeline

Oct 2011

Target Feb 2012

Jul 2012

Jan 2013

-Registration of Wheelsets (Optional)

-Report Component ID via CRB (Optional)

-Report Component ID via EHMS (Optional)

-OEMs provide required data to Shops (Mandatory)

-Wheelset Registration by Wheel Shops (Mandatory)

-Shops provided <u>informational notice</u> in CRB for missing Wheelset Component IDs in **Field 327-340** on changes

-All Wheelset changes must be reported with Component ID (Mandatory)

-CRB rejected for missing Component ID

CEPM-Wheelsets Progress to-date

- Railinc.com/CEPM website launched in June to provide central place for communications
- June Circular formally introduced CEPM to the industry
- July 12th AAR/CEPM Town Hall in Chicago to discuss CEPM with wide audience of stakeholders
- Broad communication effort to educate committees regarding CEPM program objectives and timelines
- August launch of initial Umler Component Registry capabilities to facilitate communication and planning for CEPM
- Circular letter requesting feedback and comment to WABL by Oct 15th Bar Code and Data Glossary.
- AAR/CEPM Town Hall #2 November 9th
- Revised WABL Circular Letter early December
- Manufacturer's placing barcodes on all production starting Feb 2012

CEPM Roadmap

2012 – Wheelsets (Freight Cars)

2013 – Castings – Side Frames, Bolsters, Couplers

2014 and Beyond

- Brake Systems
- Locomotive – Engines, Turbochargers, Traction motors
- Tank Car – Valves, Appliances
- Intermodal Components – Hitch, Auxiliary Power
- Tracing - PTC Devices, GPS

Need More Information

WABL Committee - *Ken Rownd – AAR Committee Manager*
CSTCC Committee – Jon Hannafious – AAR Cmte Mgr
csc@railinc.com *– Registration and Web Services*
www.railinc.com/cepm - project website