



RAILBLAZERS

ALLTRANSTEK, LLC

Commercial Rail Transport Management and Consulting

October 2015

Volume I Issue III

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Closer Look Series

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RELIABILITY CENTERED MAINTENANCE

Not just for tank car qualification...

Performing interval analysis has been a longstanding requirement for tank car specific components, especially pressure and outlet valves, in order to measure lifespan and determine appropriate qualification intervals for the tank car as a whole. The benefits of performing interval analytics are being realized by the modern rail shipper, as car owners look for applications in fleets where qualification of component and car intervals is not prescribed by regulation. Ultimately, car owners are continuing to realize opportunities presented by component interval analysis to improve productivity, safety, and maintenance budgeting, while reducing the overall number of shopping events for a fleet.

The recent HM-216B requirements that went into effect in 2012 reinforced the responsibility

of tank car owners to analyze data as a mandate to ensure proper qualification interval justification. Despite the provision of HM-201 to allow owners to apply for extended qualification timelines and alternative inspection programs, which was effective in 1996, car owners typically used default minimum intervals for their tank cars. In fact, most industry participants were lacking the means to perform the analytics, as well as the motivation given minimal enforcement of the policy. In light of several high profile tank car incidents and the FRA's insistence that these policies would now be enforced, the 2012 rule launched tank car owners into a frenzy of data collection, scrambling to validate tank car qualification timelines.

(Continued on page 2)

CAR TYPE HIGHLIGHT: GONDOLA FLEET

Gondolas are used to haul a wide variety of products. With the exception of mill gondolas, gondolas are one-way cars that are reverse-routed empty back to the origin point once they are unloaded.

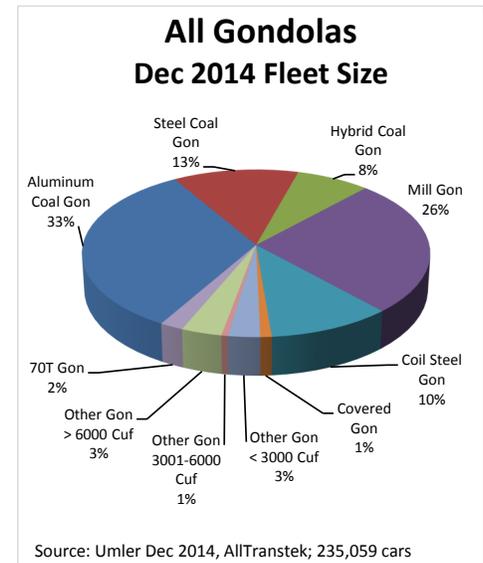
The North American gondola fleet is divided up into two main types: coal gondolas, steel mill gondolas, and other gondolas. Gondola segments are generally differentiated by the cars' cubic footage capacities, but in some cases are differentiated by the type of materials used in the car's construction.

The coal gondola fleet is the largest gondola segment at 125,800 cars. It is further segmented by material build of the car into three groups: aluminum cars, with 77,900, or 62% of the coal segment; steel cars, with 30,200 cars or about 24% of coal gondolas; and Hybrid coal gondolas, with 17,700 cars, or about 14% of the coal gondola fleet.

There are currently about 86,600 steel mill gondolas - all are 100 Ton cars. These are split

into two sub groups: mill gondolas with a fleet of 62,000 cars and coil steel gondolas, with a fleet of 24,600 cars.

There are 22,700 cars in the other gondola



(Continued on page 4)



AllTranstek ShopWatch Schedule

- **RESCAR**
Texas City, TX
Eastman Chemical
October 6, 2015
- **ONTRACK**
Plantersville, TX
EVENT
CANCELLED

Stay tuned
for 2016
update of
ShopWatch
Events

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(RCM continued from page 1)

Owners of tank cars who were not actively engaging with car repair data and interval analysis for the last ten years were missing out on a perfect opportunity to address car productivity, maintenance budgeting, safety practices, and fleet maintenance systems. While it may affect unallocated budgeting dollars, spending a little money for analytics on the front end can help car owners best budget maintenance spend and accurately reflect maintenance cycles, leading to more cost effective decision making in fleet management practices.

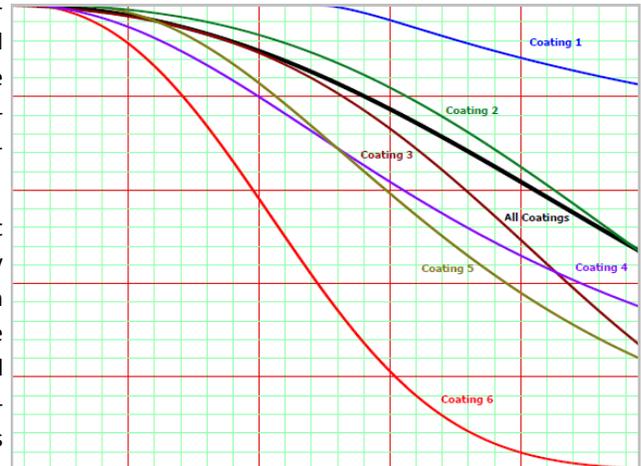
Interval analysis is an activity that falls under the category of Reliability Centered Maintenance (RCM) which grants owners of all car types the opportunity to better understand the maintenance cycles of a portfolio of railcars or the characteristics of a particular car type. Whether that means investigating the failure rates of a lining type in a plastic pellet covered hopper, determining the lifespan of a new valve in a tank car versus its reconditioned counterpart, or simply doing the required analysis on a tank car under HM-216B, RCM analysis provides the foundation for being proactive and preventative in the maintenance of a fleet portfolio.

The goal of RCM is to recondition or replace components before they fail while keeping those components in service for the longest possible time, improving safety of operations while preventing cars from unnecessary shopping events. Per regulation, tank car owners can apply for extended qualification intervals exceeding the default 10 years, potentially eliminating a shopping event over the life of the car. Conversely, an interval analysis may show that a car must be requalified on a term shorter than 10 years. A tank car owner will still realize savings by ensuring safety and avoiding car failure scenarios.

Many implications of interval analysis can be realized outside of what is solely required by tank car regulations. For an owner of any car type, avoiding costs associated with railroads stopping trains to replace wheel sets or shopping freight cars due to component failure is a significant benefit of RCM. Preventative maintenance as a product of interval analysis allows car owners the opportunity to recondition a component or obtain a reconditioned

component before failure and before a new component is required.

Total fleet size reductions are a potential added benefit of RCM. As shippers improve railcar productivity by reducing shopping events, fewer cars are required to handle shipment volume. Thus, preventative maintenance through interval analysis allows the shipper to employ a safer car that is ultimately more cost effective.



The above interval curves illustrate component failure rate analysis that can be performed for any type of car or component associated with that car. In this case, coating failure rates were analyzed to determine effectiveness and lifespan. This chart appears to show Coating 6 failing at a significantly higher rate than other types, falling well below the average failure rate (shown in black). However, this case shows that understanding the reason for failure is equally important to the replacement rate. It was discovered that the majority of linings were not replaced due to failure. While a small portion of linings may have failed, the majority were prematurely replaced on a scheduled timeline that did not actually reflect product life. RCM analysis granted the users of Coating 6 extended replacement cycles, allowing for more cost effective fleet management practices via reduced maintenance spend.

The final results of conducting RCM analytics may not always facilitate a change, rather RCM may support a shipper's products and process, making companies more defensible as rail shippers. The fruit of RCM analytics may not always mean that a change is necessary to be productive, and may actually assure shippers and car owners that established maintenance systems operate reliably without leaving money on the table, while decreasing the likelihood of a catastrophic event.

WHEEL SET REPLACEMENT

Wheel set replacement continues to be the number one annual maintenance expenditure in the North American rail industry. All-Transtek estimates the wheel set market size at approximately 1.1 million wheel sets annually with a total value of over 1 billion dollars. Quantifying the relationship between a car's mileage and wheel set life is essential to budgeting properly for maintenance spend and equally important for avoiding catastrophic and costly events such as derailment.

Owners of high mileage fleets, specifically coal gondolas and coal open top hopper fleets, are inherently more exposed to risk associated with wheel set failure. Understandably, high mileage fleet owners mitigate risk and cost inherent to high mileage fleet maintenance by engaging in preventative maintenance. Improved utilization and increasing numbers of annual trips for large general purpose tank cars should have tank car owners preparing for higher wheel set expenditures, as tank cars continue to experience annual mileage

totals that have outpaced mileage expectations for the car type.

Whether or not a shipper owns a high mileage fleet, it is important understand fleet mileage and wheel replacement cycles for all railcar users who proactively maintain costs associated with wheel set maintenance. It is in a shipper's best interest to decide on the optimal wheel set replacement time in order to secure reconditioned wheel sets before a failure forces railroad intervention, which may result in the use of a significantly more costly new wheel set for replacement.

Past trends in preventative maintenance practices have seen some shippers buying and storing wheel sets at repair facilities frequented by their fleet, ensuring the availability of reconditioned components while also recognizing discounted pricing opportunities through buying in down markets or purchasing wheel sets in bulk.



AMSTED ANSWERS: WHEEL SETS

What does the wheel demand look like for 2016? Are there any outstanding trends visible in the wheel set market?

We expect some softening in demand, more so in the OEM manufacturing sector due to the forecasted decline in new railcar production. Still, most industry experts would suggest between 59,000 and 64,000 units in 2016, which is well above our average annual deliveries over the last 15 years.

How does the reconditioned wheel set market differ from new wheel sets? Are there enough cores available to meet demand for reconditioned wheels?

Approximately one-third of the aftermarket wheel set supply comes from turned (recycled) wheel plates. Due to refinements in wayside detection and the use of telematics, like our IONX wireless sensors, we are better as an industry at identifying potential failures before they occur. This gives the industry more opportunities to recondition wheel set components, including wheel plates, bearings, and axles.

Due to low scrap prices, indecision surrounding tank car fleet regulations, and improving railroad velocity, the industry has been slow to retire certain railcars. Changes in these variables will increase core availability.

What are the factors that would shorten a wheel set's life? What measures can a car owner take to extend the life of their wheels?

The most significant factor affecting wheel life is the environment in which it operates. Cold climate, heavy grades, and curves can shorten wheel life significantly faster than warm climate and flat, straight track. Premium wheels and trucks alongside tread conditioning brake shoes have been shown to improve wheel life.

Do you feel the current high kip trigger increments (65, 80, 90) are appropriate?

It depends on your perspective. The threshold levels are actually a trade-off between reduced operating risk and damage to the infrastructure and equipment, compared against the cost of wheel replacement and car out-of-service times. These levels are a risk management decision and fall outside the responsibility of the wheel manufacturers.

In light of the recent FRA warning regarding derailments with low kip wheels, what might be the effect on car owners?

Amsted is aware of suggestions to lower the impact thresholds. Derailments caused by vertical split rim wheel fractures display the type of tread damage that causes high impacts. However, crack growth rates expand quickly in vertical split rim fractures, and a lower impact threshold should reduce the number of complete failures for wheels displaying vertical split rim cracking by allowing for earlier detection. There is a new class of alloy wheel that reduces tread damage believed to be attributed to vertical split rim.



2015 Schedule of Events

SWARS

Dallas, TX

Oct. 7-9

NEARS

Philadelphia, PA

Oct. 14-16

Tank Car Committee Meeting

Colorado Springs, CO

Oct. 21-22

National Industrial Transportation League (NITL)

New Orleans, LA

Nov. 15-17

RailTrends

New York, NY

Nov. 19-20



RAILCAR STORAGE OPPORTUNITY

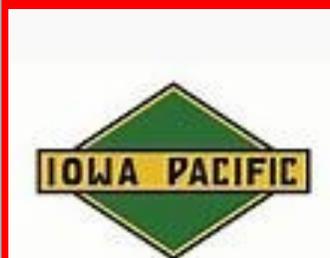
AllTranstek has recently begun working with Iowa Pacific Holdings to assist them in marketing their long-term storage business. This storage is primarily targeted towards large blocks of cars, typically unit trains that serve the coal, frac sand, and crude oil markets.

Iowa Pacific Holdings storage locations are strategically positioned in the major energy corridors, including the Northeast, Southwest, and Western regions.

Short-term storage is also available, but space is limited.

For more information on this opportunity please contact Chad Perrewe at AllTranstek.

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O: 630.829.9150

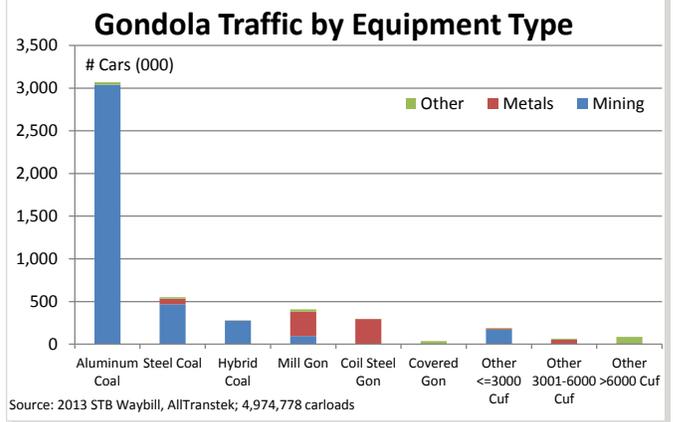


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segment. These are generally differentiated by size or weight capacity in the case of the 70 ton gondola, which ranges in capacity from under 3000 cubic feet to over 6000.

Shipments in gondolas are heavily skewed toward coal service, which accounts for 76% of the fleet traffic volume. The fleet does not move a significantly diverse commodity base, as the remaining shipments are dedicated to moving other bulk materials in the mining, metals, waste products, agriculture, and forest products industries.

The traffic base for the gondola fleet partially recovered from the recession of 2008-2009, during the years of 2010 and 2011. However, the excess of natural gas fueling energy production for large utilities companies, coupled with clean energy movements from the EPA, have displaced coal shipments the last 3 years,



with shipment volume in 2013 down 4.3% y/y. A high retirement rate has kept the surplus falling since the recession, as 2013 saw the surplus volume fall below 50,000 cars for the first time since 2008. Utilization of the fleet climbed to 78.3% in 2013, up a full 5% from 2011. The fleet surplus and utilization metrics are expected to remain stable moving forward as the total fleet size continues to acclimate itself to a diminished coal market which may never again exceed four million coal carloads.

All charts and graphs come from Gondola Closer Look Report

ALLTRANSTEK INTERVAL ANALYSIS

When it comes to performing Reliability Centered Maintenance (RCM) analytics, more data is better. At AllTranstek, we take pride in our ability to operate on the frontier of data analytics in the rail shipping space, a testament to both the quantity and quality of fleet maintenance data we collect. Our analytics platform allows us to stream data from all areas of our extensive program offering to optimize fleet management solutions.

Interval analysis by way of RCM analytics can be performed in various ways. Traditional fleet analysis can be executed for an individual car owner by collecting repair data for a single fleet over a scheduled time frame, allowing us to isolate one customer's current fleet, components, and maintenance practices. Further analysis of car and component life spans may highlight cost saving opportunities.

Even more dynamic solutions are available through our service offering as we continue to grow our analytics platform and systems. AllTranstek's qualification and interval analysis for tank cars may be more efficiently performed through data pooling opportunities via the StencilWatch™ package. Fleet repair data collected for participants in the StencilWatch™ package may be combined with other data sources available in our data warehouse. Of course, this kind of data analysis is only performed with the permission of the client, and

client confidentiality is always fully maintained throughout the entire process.

Car owners frequently engage in interval studies as an essential practice in maintenance cost management. Knowing when and how frequently to change components significantly reduces failure rates and unnecessary shopping events, while still allowing a component to remain active as long as possible.

Data pooling opportunities allows AllTranstek to perform more comprehensive interval analysis for any component by utilizing sources with much larger sample sizes and distinguished history. Small clients have the chance to better understand their replacement intervals through benchmarking against large sample sizes, while larger companies can engage with data for niche car types and specialty components. Ultimately, this leads to greater time and cost efficiency for our clients. With a whole new fleet of DOT117 cars entering the market, data pooling will be instrumental to understanding the maintenance needs and qualification timelines of this fleet efficiently.

Interval analysis is a proactive step toward increasing car productivity and budgeting maintenance spend. Our systems and process offer customers decision tools that can become a regular part of a fleet management program.

EMPLOYEE SPOTLIGHT

Mike Untermeyer - Fleet Engineering

Mike joined AllTranstek in May of 2015. He has thirty-seven years of experience in the railcar, pressure vessel, and petrochemical industries. He spent twenty-nine years with Union Tank Car with responsibilities ranging from welding engineer, product design engineering, manager of welding and materials engineering, and quality assurance manager. Mike now consults clients on welding, quality assurance, engineering, and offers expertise on manufacturing and regulatory interpretation. He also chairs the AWS D15 Railroad Welding Committee and the standing AAR Welding Task Force. He serves as a welding and special processes consultant, but his well rounded experience in the rail industry allows him to work in a versatile role here at AllTranstek. He also has experience in tank car and freight car manufacturing, NDE, and failure analysis. Mike holds a B.S. in Welding Metallurgy from Texas A&M University.

Gino Smith - Regulatory Compliance

Gino started with AllTranstek in November of 2014 as a Quality Assurance & HazMat Inspector. He began his career in transportation in 1982, as a Marine electrician tasked with repairing naval vessels. After the Navy, Gino got his first taste of rail transportation at Metrolink, where he worked on passenger commuter cars for six months before making the career move to Amtrak. He was employed with Amtrak as a passenger car electrician, locomotive electrician, and passenger car supervisor. After nine years, Gino was offered a career changing opportunity to work with the Bureau of Explosives as a Quality Assurance Inspector, moving him from the world of passenger cars into the world of freight and tank cars, where he facilitated hazardous materials inspections, hazmat training, hazmat compliance, and quality assurance. He currently provides hazardous materials compliance and training, along with QA auditing and QA manual compliance. Gino's ambition is to boost AllTranstek to a significant leadership role in the HazMat compliance industry.



AllTranstek Recent Events

◆ FTR CONFERENCE

Larry Loman

Director of Engineering
*PHMSA Tank Car Rules
Finalized: Now What?*

◆ FTR CONFERENCE

Richard Kloster

Sr. Vice President
& Chief Marketing Officer
*Sizing up the Rail
Equipment Market*

2015 FTR TRANSPORTATION CONFERENCE

AllTranstek's partner in strategic services consulting, FTR Transportation Intelligence, hosted its 11th annual Transportation Conference in September of 2015. The conference continues to be an enormous success, growing to over 400 attendees for the first time in its history. Over the two-day schedule, this year's conference delivered even more focused content than previous years by way of four content channels speaking to shippers, carriers and brokers, truck and trailer equipment suppliers, and rail equipment suppliers. This year's conference hosted 46 different sessions with 66 speakers, plus an additional 6 presentations by members of FTR's esteemed staff.

FTR President, Eric Starks, showed his appreciation for all those involved in the 2015 conference, saying, "We cannot express enough gratitude to all those involved in



4 Content Channels

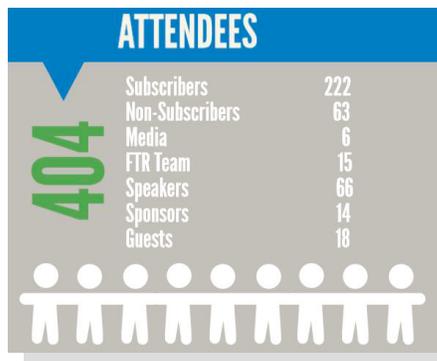
46

Sessions



66 Speakers

+6 FTR Staff Speakers



making this years conference a tremendous success. We are extremely proud to keep growing our attendance, and hope to continue providing more valuable content for those faithful to the conference year by year. To all our speakers and sponsors, we extend a special thanks for your participation and involvement in making this conference a possibility."

Don't miss your chance to attend the premier forecasting event of the year for freight and transportation equipment. Save the date for the [2016 FTR Conference](#), scheduled for September 13-15 at the historic Union Station in downtown Indianapolis, IN.

1 Platinum
4 Gold
7 Silver
7 Conference

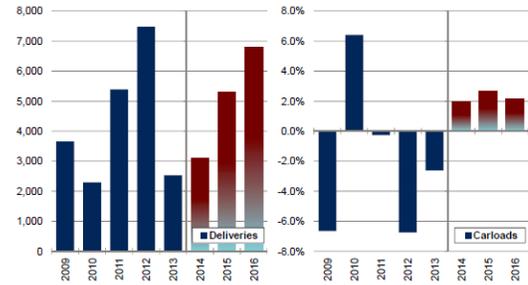
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FTR OUTLOOK: GONDOLA FORECAST

- ◆ **Freight:** Gondola traffic is projected to total 5,436,000 carloads in 2015, a 2.9% increase y/y; then flatten over the 2016-2018 period at a 2.0% AAGR, reaching 5,775,000 carloads by 2018.
- ◆ **New Cars:** Deliveries will recover in 2015, up 70% y/y, to 5,300 cars. Over 2016-2018 deliveries will average 8,000 cars, a 20% AAGR, with GB at 73% and Alum GT at 21%.
- ◆ **Inventory:** Retirements will total 8,900 cars in 2015, up 31% y/y, and continue at this level over 2016-2018.
- ◆ The fleet will continue declining in 2015, falling to 221,000 cars, down 1.6% y/y; then shrinking to 218,600 cars by 2018, a -0.4% AAGR over the 2016-2018 period.
- ◆ The surplus will fall to 41,100 cars in 2015, down 6.3% y/y, then increase to 44,000 cars by 2018, a 2.3% AAGR.

N.A. Gondola Outlook



Source: FTR; Copyright 2014

Gondola Market Indicators: 2014Q3

Actual, Not Seasonally Adjusted	2013 Q4	2014 Q1	2014 Q2	2014 Q3
Orders	100	1,700	1,542	195
% Change, Y/Y	-84.8	1114.3	671.0	-90.1
Backlogs	1,786	3,400	4,555	3,128
% Change, Y/Y	-10.8	159.9	487.7	43.6
Deliveries	493	26	387	1,563
% Change, Y/Y	-54.7	-96.0	-53.5	181.1
Backlogs/Deliveries Ratio	3.6	130.8	11.8	2.0
Net Orders/Deliveries Ratio	0.2	65.4	4.0	0.1

Source: ARCI Committee of the Railway Supply Institute

- ◆ Fleet utilization will peak at 81.6% in 2015 and remain in this range over the 2016-2018 period, averaging 79.6%.
- ◆ **Changes from last Forecast:** Higher utilization, lower surplus.
- ◆ **Downside Risks:** Additional regulations on coal emissions, power plant conversions to natural gas.
- ◆ **Upside Risks:** Replacement potential, weather related demand opportunities.

All charts, graphs, and data are derived from the FTR Rail Equipment Outlook Report

For more information on this report, please visit www.ftrintel.com/REO



The Closer Look Series is comprised of six individual reports, each of which exclusively covers one of the major car types: Covered Hoppers, Tank Cars, Gondolas, Open Top Hoppers, Box Cars, or Flat Cars. These reports provide invaluable information and insight for longstanding rail equipment industry participants, as well as new entrants to the industry. Among the companies who will benefit the most are fleet owners, leasing companies, new car builders, component suppliers, service providers, financial institutions, investors, rail carriers and shippers.

The Closer Look Series scrutinizes the current railcar market from a variety of angles, analyzing trends in fleet size, age, ownership, segmentation, commodity traffic bases, new car deliveries, retirements, utilization, attrition, car surpluses, and much more.

For more information on The Closer Look Series, please contact Chad Perrewé at AllTranstek.

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Founded in 1994, AllTranstek has grown into one of North America's largest railcar management and consulting companies, currently managing over 220,000 railcars for some of the country's largest fleets. AllTranstek also provides technical, operational, and strategic consulting services to a broad range of companies active in the rail and rail equipment supply chains. No other company has the combination of institutional knowledge, innovation, and independence that characterizes AllTranstek. As an independent company, with no ties to outside funding from industry, or government, our clients can be confident that we always have their best interests in mind. AllTranstek continues to cultivate strong relationships with clients both large and small because of our ability to creatively and flexibly tailor services of various sizes and scopes to each customer's individualized needs.