

RAIL MAINTENANCE: A Challenge to Communicate?

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WRI Transit Panel Session, May 3, 2011



Subjects

- Rail Maintenance: As Personal Discovery
- The Body of Knowledge Emerges
- Metrics to persuade budget deciders



Rail Maintenance: Not Easy to Grasp?

- Grinding is counter-intuitive
- Sound Walls are intuitive
- Lubrication: Easy to understand, subtle



One Engineer's Slow Education on WRI

- We're grinding the rail?
- Rail Profiles: a moving target
- Hire the experts.....
- Putting it together



Speno Grinding Train



Speno Grinding Car



24-Stone Fairmont Grinder

With Adjustable Grinding Patterns



The WRI



Hire the Experts (a small property)

- Analysis and Reports
- Contracting for Grinding
- Grinding as done by field managers
- Go to WRI Conference
- Package Comprehensive Services:
 - Survey of rail profiles and parameters
 - Manage Grinding Campaign
 - Post-Grind Survey and Report: Staff Too



Emerging BOK: HAL

- Understanding Top Of Rail (TOR) friction management to control low rail roll-over derailments
- Contact stresses and resulting head checks, expressed as Rolling Contact Fatigue (RCF)
- Efficiently exploiting the rolling radius differential to steer wheelsets
- Improved rail steel
- Inter-relation of the wheel and rail profile maintenance
- Fuel and energy implications of reduced flange contact
- Improved chemistry and application techniques of gage face and TOR lubricants
- Benefits of proper wheel maintenance



Emerging BOK: Transit

- Flange squeal, corrugation noise, and vibration as public complaints
- Noise impacts estimated for environmental clearance of new projects
- Ride quality and noise experienced by passengers
- Gage Face Angle (GFA) related to wheel climb derailments
- Asset life extension
- Total control of the WRI as possible due to the absence of “free running” interchange freight or passenger cars.



We Want Good WRI Maintenance

How do we get it?

- Advances in profile measurements
- Improved control of rail grinding angles
- Improved surface finish
- Understanding corrugation causes
- Rail friction management
- Budgeting: Life Cycle vs. Maintenance



Communicating WRI Maintenance Needs

Why Don't They Like Us?

- Very Technical, somewhat counter-intuitive
- Rail grinding and lubrication is a long-term payoff (noise?)
- Rail grinding requires large blocks of track time
- Rail lubrication, analysis, and grinding are specialized needs, not amenable to “low bid” procurement
- Rail grinding is often categorized as an operating expense instead of a capital maintenance (life cycle replacement) cost
- Many properties do not have resident expertise to manage the procurement of WRI services
- Many properties are not concerned about wheel life



WRI Maintenance Metrics

We have good news:

- The lowest cost WRI maintenance is the “good” condition
- Extended rail life due to:
 - Reduced replacement requirements due to gage face and top wear
 - Reduced replacement due to fatigue; reduced formation of detail fractures
 - Reduced replacement due to severe corrugation
- Reduced gage widening stress on the track structure
- Reduced propulsion energy due to reduced gage face contact friction
- Reduced turning and replacement of wheels
- Reduced risk of derailment due to GFA or dry rail wheel climb or low rail rollover



Alternatives to Good WRI

- “Good Cop – Bad Cop”
- Expensive remedial work for a degraded WRI
- Increased purchases of replacement rail and wheels
- Increased demand for track time to replace the rail
- Reduced availability of rolling stock due to replacing wheels
- Increased flange squeal noise
- Increased corrugation: vibration and noise
- Increased service interruptions due to detail fractures in rail
- Hostile public perception of rail systems; environmental resistance to future expansions



Summary

- WRI Maintenance is
 - Highly technical
 - Highly beneficial
 - A “Team Sport” of many departments
- Short-Term vs. Long-Term
- Obtain funding through sound business metrics
- Sound Walls are not our friend

