
Rail Loadout Performance & Productivity

Process Improvement

May 24, 2006

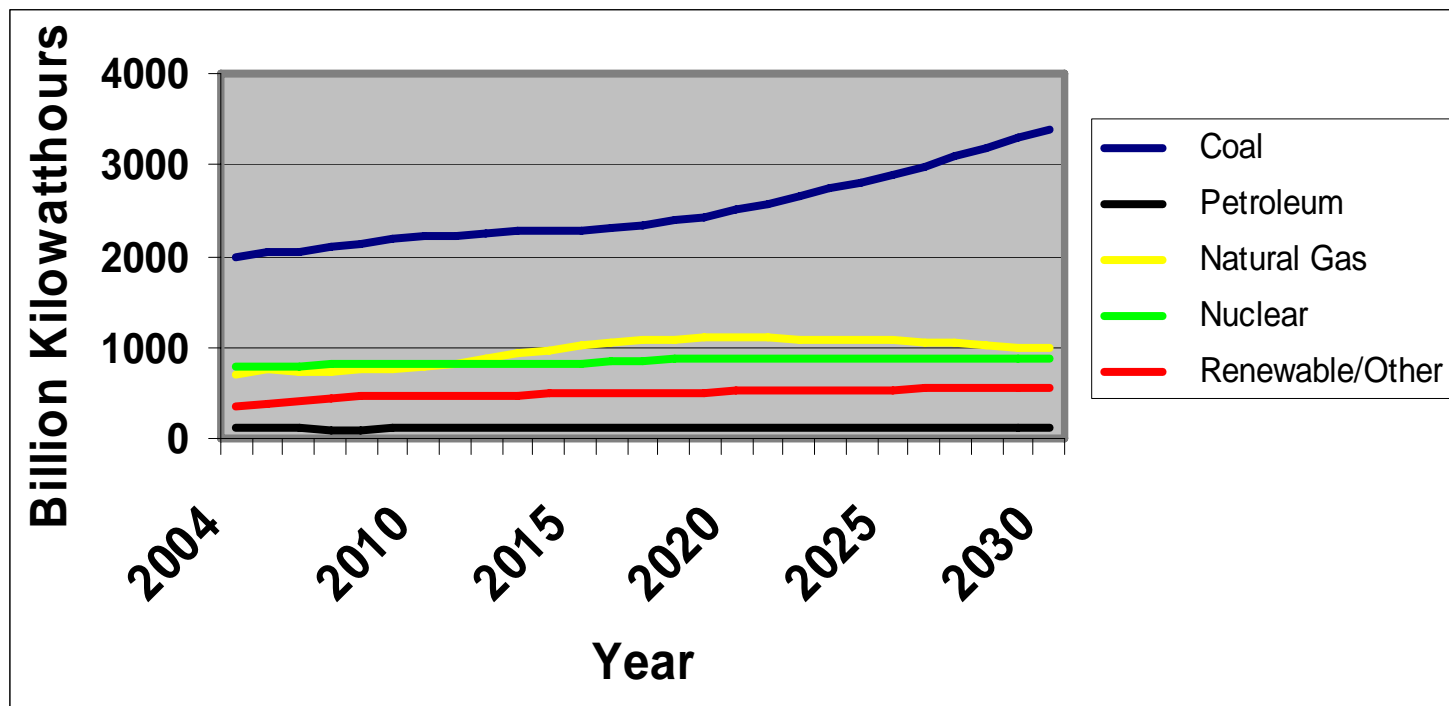
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ACC
American
Coal Council

Demand for coal is growing and putting significant pressure on the coal transportation supply chain

- The Energy Information Administration projects 700 million more tons by 2030

Predicted Electricity Generation by Fuel Through 2030



Source: Energy Information Administration, Annual Energy Outlook 2006

To better understand this challenge, Norbridge recently interviewed fuel procurement and transportation managers at sixteen utilities

- **Phone interviews were conducted during November 2005 to February 2006**

Utilities Interviewed

<ul style="list-style-type: none">• AES• Alliant• Ameren• Arizona Public Service Company• Cinergy	<ul style="list-style-type: none">• Consumers Energy• DTE Energy• Entergy• First Energy• LGE Energy• Midwest Generation	<ul style="list-style-type: none">• NIPSCO• Progress Energy• Salt River Project• SCANA• Xcel Energy
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We surveyed utilities on three categories of issues: equipment, facility, and transportation management

Examples of Coal Transportation Issues and Problems Impacting Productivity (Based on 16 Utilities Surveyed)

Equipment Management	Facility Management	Transportation Management
<ul style="list-style-type: none"> • Slow process times • Outdated equipment • Small cars • Increased repairs and maintenance • Car shortages • Limited performance measures • Capital shortages 	<ul style="list-style-type: none"> • Poor productivity due to outdated facilities • Limited facility maintenance • Capital shortages • Limited performance measures 	<ul style="list-style-type: none"> • Slow process times <ul style="list-style-type: none"> – Arrival at power plants to departure – Railroad cycle times • Rail performance <ul style="list-style-type: none"> – Time in transit – Transit time consistency – Communication – Asset availability

The conclusion from the utility end of the supply chain is that change is necessary and improved operational cooperation is needed

Implications

- ***Many Are Not Prepared*** - Many power plants and transportation providers are not prepared to handle significant increases in coal traffic.
- ***The Time for Change is Now*** - In fact, many companies are facing problems even at current traffic levels.
- ***Equipment Reinvestment is a Necessity*** - Transportation equipment needs to be updated, maintained and managed more efficiently.
- ***Facility Modernization is a Necessity*** - Unloading facilities need to be modernized, maintained and more productive.
- ***Significant Need for Process Improvement*** - Process times need to improve significantly and become more consistent.
- ***Need for Operational Cooperation*** - All participants in the coal supply chain need to work closely and proactively to ensure that the transportation network can handle projected increases in coal volumes.

Thus the next question is how well prepared are the mines and can they handle the impending growth

- **Norbridge has not conducted a formal survey of loadout performance that we can public share**
- **We have however performed several load-out performance improvement client assignments**
- **And the following is what we have learned...**
 - ... they are most successful when they are performed with input from and in cooperation with supply chain partners**

Projects at rail loadouts can increase capacity without significant capital investments – process improvements are key to success

Typical Project Objectives for Rail Loadout Projects

- **Increase rail loadout capacity**
- **Improve rail loadout procedures, practices and processes**
- **Reduce time to load trains**
- **Develop internal and external performance measures to track performance**
- **Improve communication and teamwork between coal company and railroad employees**
- **Improve resource utilization – staffing, equipment**

At an underground mine in West Virginia, we found numerous loadout performance improvement opportunities

Examples of Performance Improvement Issues at WV Mine Rail Loadout

Mine-Related Issues

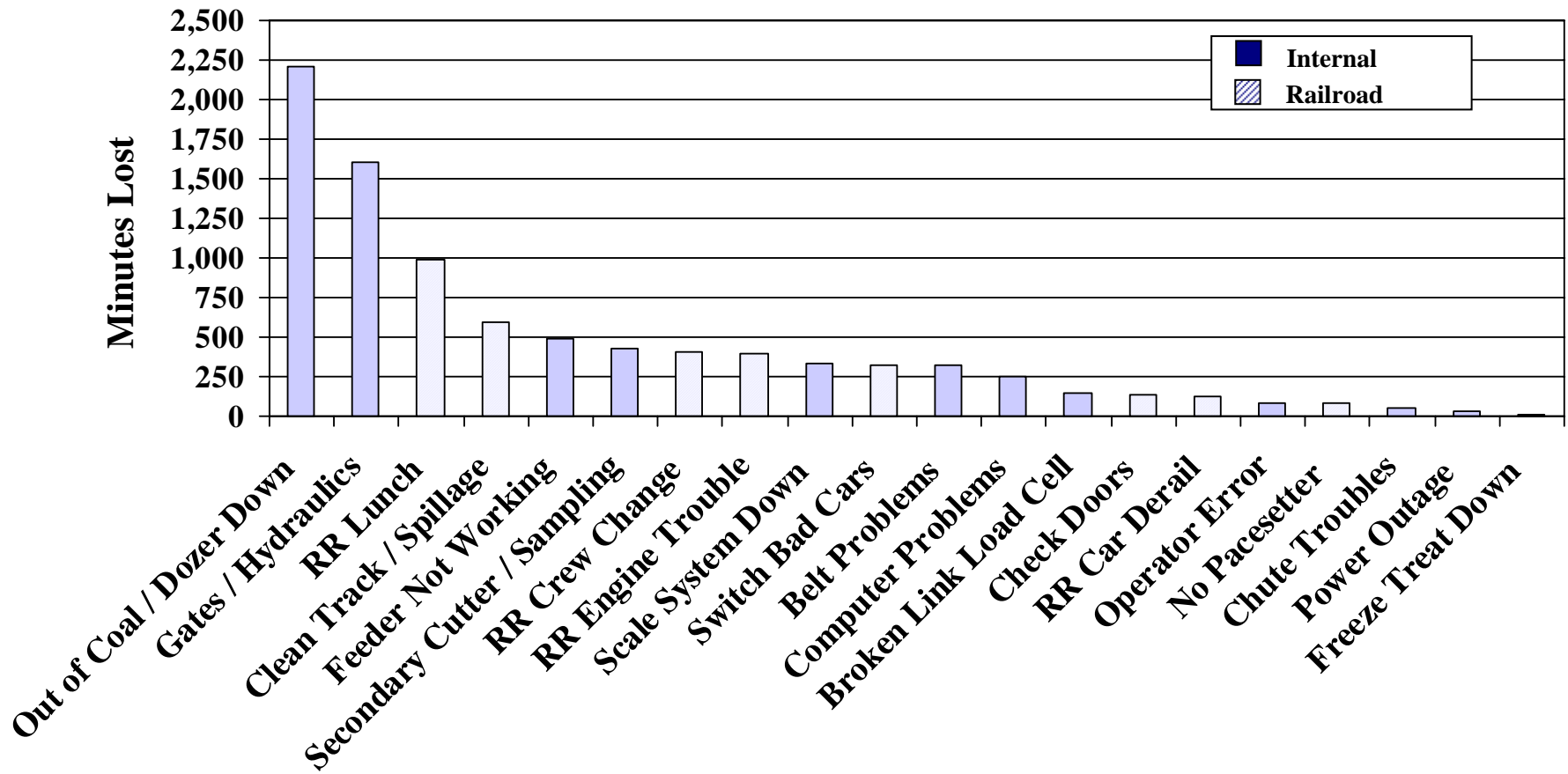
- **Under-loading cars**
- **Endloader/dozer mechanical issues and availability**
- **Hydraulic system leaks**
- **Lack of proactive loadout inspection process**
- **Loading delays**

Railroad-Related Issues

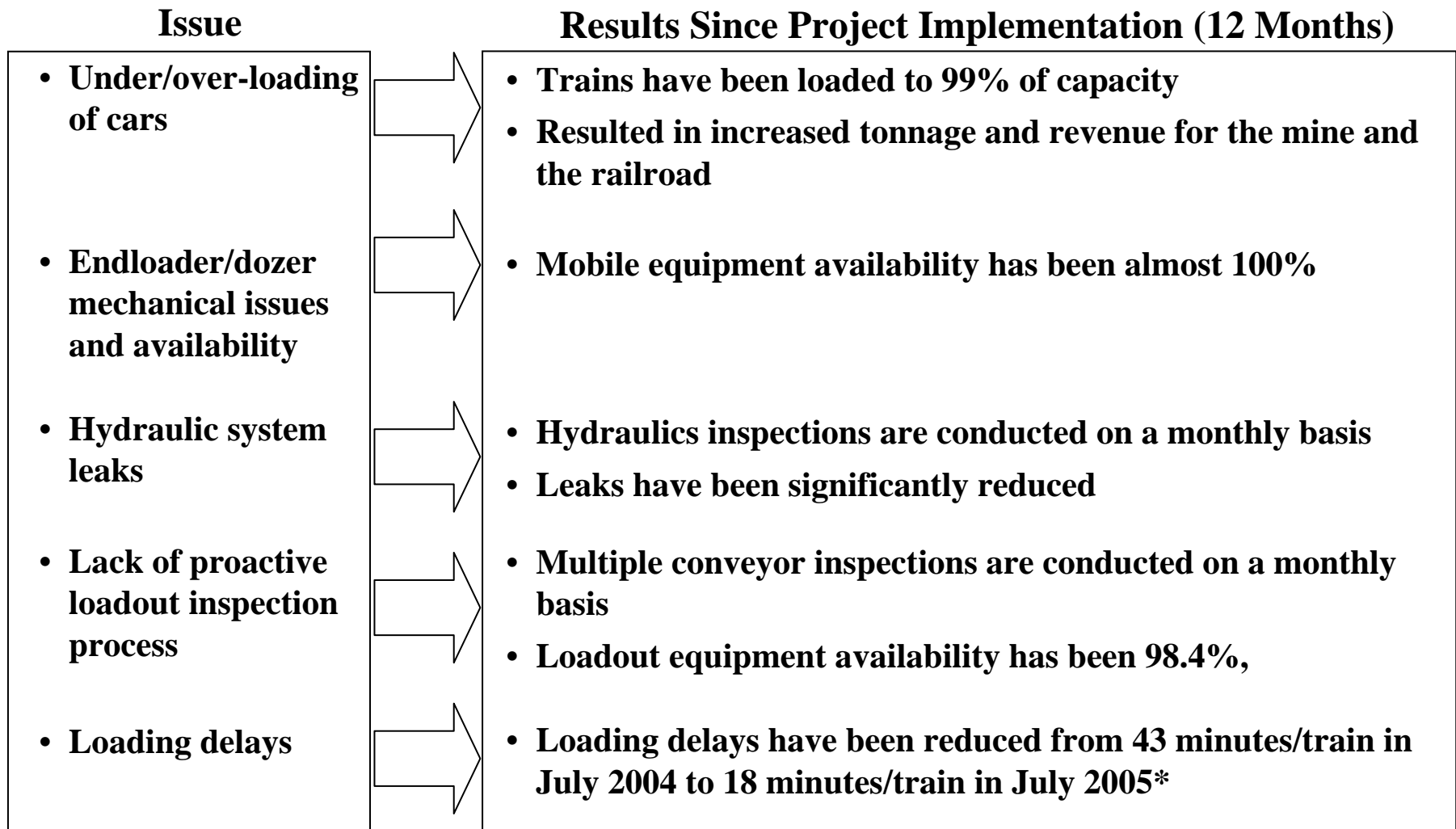
- **Lengthy process from train arrival to loading**
- **Frequent rail-related delays during loading**
- **Lots of bad cars and open doors**
- **Frequent arrival of trains without railroad notification**
- **High percentage of trains loaded below minimum tonnage**

Loadout delays were due to a variety of problems – about 2/3 were due to internal problems while 1/3 were railroad-related

Time Lost due to Loadout Delays by Problem



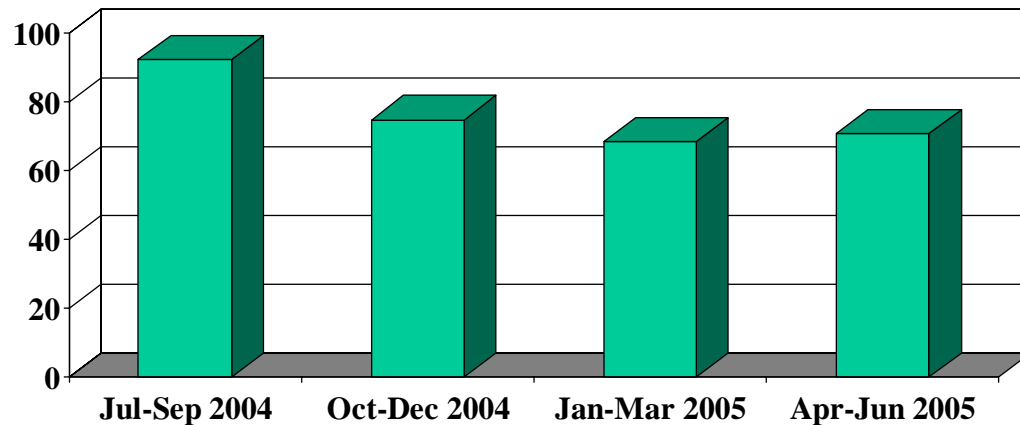
Internal performance improved significantly...



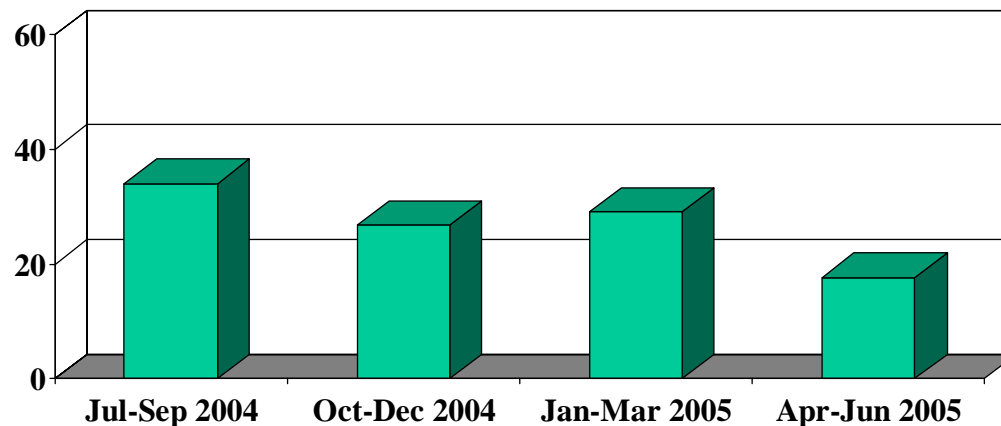
* Based on first three weeks of the month

...and railroad performance improved too

Average Minutes from Train Arrival to Loading
23% Decline from Q1 to Q4 (Since Implementation)



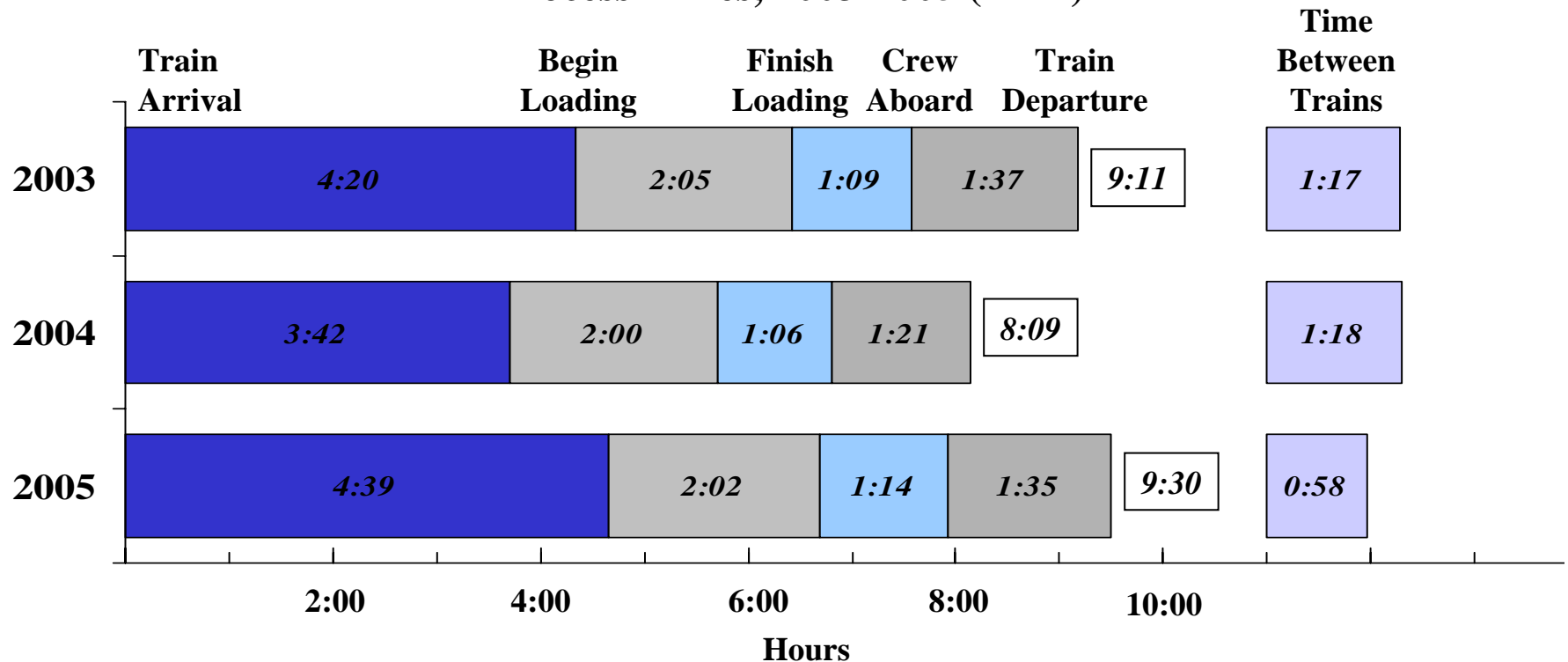
Average Railroad-Related Delays Per Train (Minutes)
47% Decline from Q1 to Q4



We also worked on a rail loadout project at a large Wyoming mine

- A typical train was on-site at the mine for 8-10 hours, with time between trains averaging approximately one hour

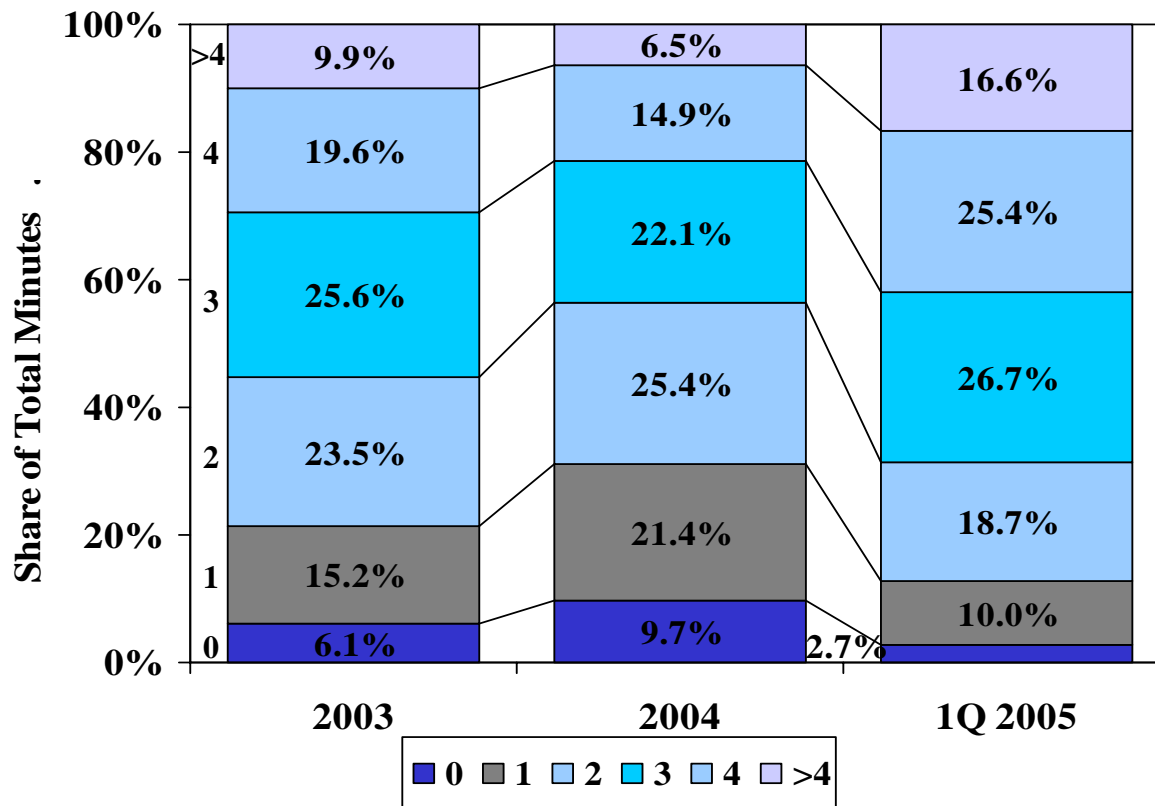
Process Times, 2003-2005 (YTD)



The number of empty trains on site was analyzed since it is an important indicator of railroad and loadout performance

- The mine was without empty trains to load for 7% of the time between 2003 and the first quarter of 2005, and had fewer than two empties for 25% of the time.
- There were 1,100 periods with no empty trains on site, lasting an average of 1:17.

Total Number of Empty Trains by Percent of Total Time



Sub-teams were established to address performance improvement challenges and opportunities

- **These sub-teams developed performance improvement strategies in each area to ensure that the loadout can handle the level of traffic that is projected in the next few years.**

Mine Sub-Teams

- **Planning and integration of pits, plant and loadout**
- **Loadout operators**
- **Integrated delay tracking**
- **Loadout maintenance**
- **Track capacity – present and future**
- **Manual processes**

Joint Sub-Teams with Railroads

- **Crew management issues**
- **Communication issues**
- **Dispatching**
- **Bad cars/open doors**
- **Lack of electronic consists**

The loadout project was recently implemented, and is expected to provide significant benefits for the mine and the railroads

Summary of Benefits From Performance Improvement Strategies

Mine

- **Increased loadout capacity, flexibility, and asset utilization**
- **Faster, more efficient processes**
- **Better trained, more efficient loadout operators**
- **Enhanced coordination and communication with railroads**
- **Objective measurement of railroad and loadout performance**
- **Enhanced loadout maintenance**
- **Fewer bad cars and open doors**
- **Closer tracking of loadout delays and train location/status**

Railroads

- **Increased traffic levels**
- **Faster equipment cycle times**
- **Better van utilization and productivity**
- **Enhanced crew management at mine site**
- **Closer coordination and communication with mines**
- **Objective measurement of railroad and loadout performance using multiple criteria**
- **Easier access to bad cars for “hospital trains”**

The conclusion is that loadout productivity can be significantly improved

Conclusions

- ***Need to develop the metrics to measure and manage*** – You can't change what you can't measure
- ***Focus has to be on the processes*** - What you have is only as good as how it is used
- ***Analysis needs to drill down to the root cause*** - Focus has to be on what caused the performance
- ***Need supply chain partner participation*** – The mine and the railroads/other transport providers are co-dependent. Neither can achieve their optimal performance without the cooperation of the other
- **25 to 50% improvements can be achievable... before investing capital in hard assets**

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