BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 35305

ARKANSAS ELECTRIC
COOPERATIVE CORPORATION – PETITION
FOR DECLARATORY ORDER

REBUTTAL EVIDENCE AND ARGUMENT OF UNION PACIFIC RAILROAD COMPANY

PUBLIC VERSION – CONFIDENTIAL AND HIGHLY CONFIDENTIAL INFORMATION HAS BEEN REDACTED

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Dated: June 4, 2010

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ATTACHMENTS

COUNSEL EXHIBITS

Counsel Exhibit No. 8:	Answer and Counterclaim of Entergy Arkansas, Inc. and Entergy Services, Inc., *Union Pacific Railroad Company v. Entergy Arkansas, Inc., et al.*, Case No. CV2006-2711 (Circuit Court of Pulaski County, Arkansas, Sixth Division)
Counsel Exhibit No. 9:	Order Granting in Part and Denying in Part Union Pacific Railroad Co.'s Motion for Partial Summary Judgment on the Claims of Entergy Arkansas, Inc. and Entergy Services, Inc., *Union Pacific Railroad Company v. Entergy Arkansas, Inc., et al.*, Case No. CV2006-2711 (Circuit Court of Pulaski County, Arkansas, Sixth Division)

REBUTTAL VERIFIED STATEMENT OF DAVID CONNELL

REBUTTAL VERIFIED STATEMENT OF MARK J. DRAPER

Exhibit MJD-1:	Union Pacific Corporation 2008 Analyst Fact Book, pages 1 and 20.

REBUTTAL VERIFIED STATEMENT OF DENNIS J. DUFFY

REBUTTAL VERIFIED STATEMENT OF DEXTER N. MCCULLOCH

Exhibit DNM-1:	Dr. Tutumluer's March 15, 2009 article entitled *Laboratory Characterization of Fouled Railroad Ballast Behavior*, pages 1, 5-8, and 13.

WORKPAPERS

CERTIFICATE OF SERVICE

Table of Short-Hand References to Various Parties of Record

Party of Record	Short-hand Reference
Ameren Energy Fuels and Services Company	Ameren
American Public Power Association ("APPA"), Edison Electric Institute ("EEI"), and National Rural Electric Public Power Association ("NRECA")	Associations
Arkansas Electric Cooperative Corporation	AECC
BNSF Railway Company	BNSF
CSX Transportation, Inc.	CSXT
National Coal Transportation Association	NCTA
Norfolk Southern Railway Company	NS
Texas Municipal Power Agency	TMPA
TUCO Inc.	TUCO
Union Pacific Railroad Company	Union Pacific or UP
United States Department of Transportation	DOT
Western Coal Traffic League ("WCTL") and Concerned Captive Coal Shippers ("CCCS")	Coal Shippers

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INTRODUCTION

In the parties' opening and reply evidence and argument submissions, various shippers and associations present a multitude of objections to the reasonableness of BNSF tariff rules at issue in this proceeding and indirectly question a railroad's ability to adopt reasonable loading rules that would require that shippers' coal stay in the coal cars, rather than accumulating on the railroad right-of-way. The foundation of many of the parties' positions, however, centers on the level of concern coal dust poses as a ballast contaminant; the rights and obligations of a railroad to provide safe and efficient rail transportation, while maintaining their rail line; the obligation of shippers to secure their product in cars during loading; and whether coal dust prevention or post-accumulation mitigation is the preferred approach to addressing coal dust issues.

In its rebuttal, Union Pacific will address the most significant of the multitude of responsive points raised by shippers and associations who oppose BNSF's efforts to prevent coal dust emissions from open-top coal cars moving SPRB coal. In Part I, we respond to arguments that coal dust is no different or more dangerous than other potential ballast foulants, and address how it was a contributing cause of the 2005 Joint Line failure and accumulates on Union Pacific's SPRB rail corridor hundreds of miles from the Joint Line. In Part II, we demonstrate why the best approach to the coal dust problem requires prevention of coal dust from falling out of railcars moving SPRB coal. In Part III, we explain that shippers should be financially responsible for keeping their coal in railcars and illustrate that Union Pacific's coal maintenance costs have not been covered by rates paid by shippers. In Part IV, we emphasize that the Board's ruling should not interfere with a railroad's right to implement reasonable rules and practices, or in Union Pacific's collaborative discussions with customers concerning coal dust solutions. Finally, in Part V, we address a few miscellaneous points raised by parties opposing BNSF's tariff rules.

Union Pacific's rebuttal arguments are supported by the accompanying rebuttal verified statements of David Connell, Vice President-Engineering of Union Pacific ("Connell Rebuttal VS"), Mark J. Draper, Manager – Economic Research, Finance Department for Union Pacific ("Draper Rebuttal VS"), Dennis J. Duffy, Vice Chairman – Operations for Union Pacific ("Duffy Rebuttal VS"), and independent expert witness Dexter N. McCulloch, Senior Vice President and Director of Railroad Services for Shannon & Wilson, Inc., a geotechnical and environmental engineering company ("McCulloch Rebuttal VS").

Mr. Connell addresses various parties' conclusions regarding the cause and extent of SPRB coal dust accumulation on lines moving SPRB coal, the difficulty of detecting coal dust which has seeped into ballast, and the adequacy of both railroad capacity and maintenance planning. Mr. Draper explains how Coal Shippers' consultant Mr. Crowley incorrectly concludes that Union Pacific earns enough on its coal traffic to absorb all additional maintenance costs, including costs to remove coal dust.

Mr. Duffy describes Union Pacific's commitment to coal, the seriousness in which Union Pacific views the threat posed by coal dust when it gets into the ballast, why the prevention of potential problems is preferred over mitigating problems after the fact, and why the 2005 Joint Line derailments were not the result of deferred maintenance. And Mr. McCulloch provides further analysis of the unique characteristics of coal dust, a foreign ballast contaminant that can be prevented from penetrating ballast.

ARGUMENT

I. Coal Dust Emissions from Railcars Threaten Ballast Integrity and Efficient Rail Service

Most parties concede that coal dust negatively impacts ballast and track stability and should not be allowed to accumulate. For example:

- DOT concludes that "[u]nder certain conditions the accumulation of coal dust on and around railroad tracks can foul ballast and threaten the integrity of affected lines." (DOT Reply Com. at 1.) It also acknowledges that coal dust (a) escapes from trains and falls on tracks and (b) can undermine ballast integrity, particularly when wet. (*Id.* at 2.)

- Mr. Mike Nelson for AECC concedes that "coal dust poses legitimate maintenance issues that warrant careful consideration by railroads and shippers." (AECC Reply Nelson VS at 19); and

- Mr. McDonald, on behalf of Coal Shippers, agrees that that "there is no dispute that coal dust and other ballast fines can interfere with the proper functioning of ballast." (Coal Shippers Reply McDonald VS at 1.)

The question before the Board is whether BNSF may adopt a proactive approach to the coal dust problem in order to promote safe, reliable and efficient transportation.

A. Coal Dust's Unique Characteristics Make it a Particularly Dangerous Foulant

Despite considerable evidence to the contrary, shippers continue in their attempt to minimize the significance of coal dust as a foulant. They resist acknowledging coal dust's unique properties and contend that coal dust imposes no greater harm than other foulants.[1] But coal dust's unparalleled qualities make it both dissimilar from and more dangerous than more familiar foulants. As Dr. Tutumluer explained in BNSF's Opening Evidence, coal dust particles "have lower density and greater plasticity, meaning that they have much greater water holding ability than subgrade soil fines . . ."[2] Coal dust's unique qualities combine to present a serious and deceptively dangerous foulant best handled by protecting ballast from it than by removing it after the damage has started.

1. Foulants should be measured by volume, not weight.

Dexter McCulloch previously explained that the impact of coal dust as a foulant "must be measured according to its contribution of the volume of the fouling particles and not based solely on its weight."[3] While Mr. Mike Nelson, on behalf of AECC, agrees with this principle,[4] the majority of shippers ignore the premise that volume is the proper measurement when determining ballast fouling and insist other substances are more important because their combined weight is greater than the coal dust.

By concentrating on its weight rather than volume, shippers have underestimated the significance of coal dust relative to other foulants. It takes far less coal dust by

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1 *See* Coal Shippers Reply Ev. at 13-15; AECC Reply Ev. at 22-24; *see also* Associations Reply Com. at 7-9; AECC Reply De Berg VS at 7-9.

2 BNSF Op. Tutumluer VS at 1.

3 UP Reply McCulloch VS at 2, 10-11.

4 AECC Reply Nelson VS at 2-3.

weight to completely foul ballast, compared to other foulants.[5] For example, "if coal dust accounted for only 15 to 20% of ballast weight, it would comprise 45% of the ballast volume and completely fill the voids in the ballast, making it highly fouled." (McCulloch Rebuttal VS at 5.) And Nelson agrees that "coal dust occupies the largest volume per unit of weight." (AECC Reply Nelson VS at 3.)

But even Mr. Nelson underestimates the problems associated with coal dust. In an effort to find fault with Mr. Tutumluer's research, he (1) "misses completely the fully fouled volume comparison of coal dust to other contaminants, (2) uses the wrong values for specific gravity, (3) misses the pertinent point of why the difference between volume and weight is relevant, and (4) ignores the survey data that demonstrates that coal dust accounts for a significant share of fouled material at locations well beyond the Joint Line." (*See* McCulloch Rebuttal VS at 2.)

First, Mr. Nelson criticizes Dr. Tutumluer for not reporting the results of tests involving clay or granite at the cubic volume level exhibited by coal dust in the "25 percent by weight" test. However, Dr. Tutumluer does in fact include these results in Table 2 of his article. Using these measures, Dr. Tutumluer found a notable reduction in shear strength for ballast fully fouled by coal dust compared to ballast fully fouled by clay or granite. In Dr. Tutumluer's direct volume to volume comparison, coal dust weakens ballast more than clay or mineral filler. (McCulloch Rebuttal VS at 2-3.)

Second, had Mr. Nelson used the correct values for specific gravity (instead of in-place values), his calculations would have concluded that ballast fines "weigh nearly three times as much as the same volume of coal dust (instead of his 2.1 factor). (*Id.* at 3-

5 UP Reply McCulloch VS at 2; *see also* BNSF Reply Ev. at 9-10; BNSF Reply Van Hook VS at 6-7.

4.) Had Mr. Nelson used the correct values, his other-contaminant-to-coal-dust comparison would have resulted in comparing slightly more than one-third (as opposed to half) of a cubic volume of other contaminants to an equivalent weight of coal dust thus demonstrating that an equal amount of coal dust by weight would present a more significant threat to ballast integrity than other contaminants.

Third, while shippers claim "that other fouling agents such as sand and dirt are more significant than coal dust," their claims inappropriately "rest on a comparison of the weight rather than a comparison of volume." (*Id.* at 4.) Finally, in criticizing the details of Mr. Tutumluer's research, hoping to somehow cast a shadow on his scientific conclusions, the shippers' witnesses all ignore the Shannon & Wilson studies, which confirm the presence of substantial amounts of coal dust on Union Pacific's track hundreds of miles from the Joint Line.[6]

2. Coal dust is a foreign substance, so unlike other foulants, it can be prevented from permeating ballast.

Mr. Nelson, on behalf of AECC, incorrectly dismisses coal dust as just another contaminant.[7] AECC, along with other shippers, fails to explain or to even acknowledge the appreciable differences between coal dust and other foulants. They ignore a key distinction: coal dust is a foreign substance deposited by open-top coal cars during transport that can be prevented from fouling ballast. In contrast, other foulants "are either naturally-occurring or result from the break down over time of railroad structure components." (McCulloch Rebuttal VS at 1.)

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6 *Id.* at 4-5; *see* UP Op. Connell VS, Exs. DC-8 & DC-10.

7 *See* AECC Reply Nelson VS at 4-5, 8.

Other principal foulants are products of the wear-and-tear of the track components themselves, the breakdown of ballast into particles and the abrasion of concrete ties—due to the accumulated tonnage over the track. (*Id.*) Other potential foulants, such as wind-blown sand and dirt, are naturally-occurring and impossible to eliminate. (*Id.*)

In contrast, coal dust is a foreign substance whose presence can be controlled. (*Id.* at 1, 7.) Uncontrolled, the presence of coal dust "greatly increases the rate of fouling of the ballast section." (*Id.* at 7.) Coal dust is not only a potent foulant in its own right, but its presence also accelerates the wear on concrete ties and ballast as well as the creation of additional fines. (*Id.*)

3. Coal is more brittle than other foulants.

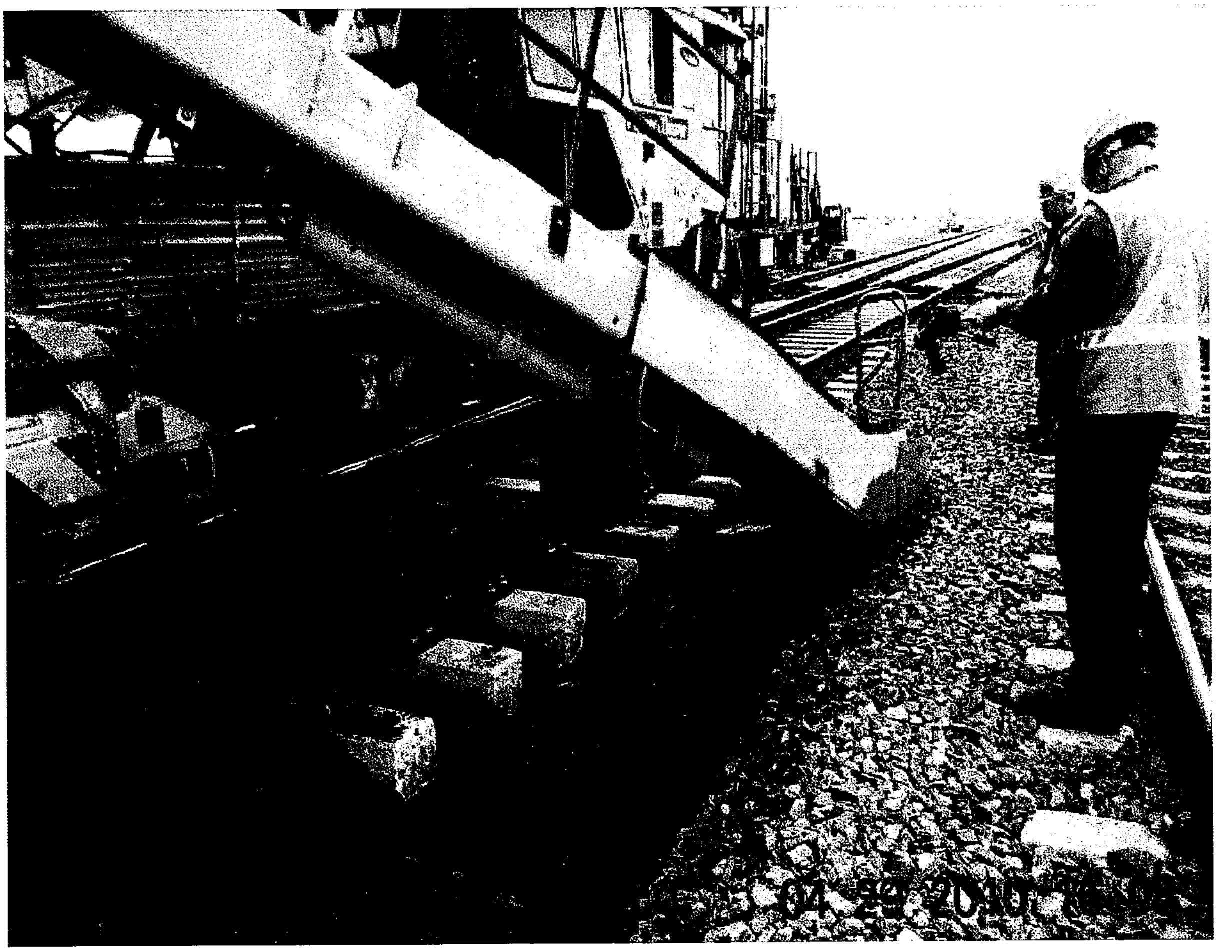
Coal is brittle and physically weak, especially when it is compared to concrete and granite. (McCulloch Rebuttal VS at 7.) Because of these physical properties, coal fragments break down more quickly in a ballast section than concrete ties or ballast rock fragments. (*Id.*) As a result, the finer coal dust particles impair drainage more rapidly than other foulants, and "the retained water in the track ballast accelerates the overall breakdown process." (*Id.*)

4. Detecting the presence of coal dust in ballast can be difficult.

Various shippers downplay the fact that coal dust is difficult to detect in the ballast, asserting that experienced "railroad men" and available technology should easily identify ballast areas needing maintenance.[8] But as fully explained in Union Pacific's Opening Argument, coal dust is difficult to see because of its fine particles and because it

8 *See* Coal Shippers Reply Ev. at 9; AECC Reply De Berg VS at 5-6.

easily permeates the ballast.[9] For example, the photograph below shows the undercutting process on Union Pacific's South Morrill Subdivision, approximately 260 miles from the Joint Line, on April 29, 2010, and demonstrates that coal dust can and does remain undetected above the surface even when significant amounts of coal dust accumulates below the surface.



Due to difficulties in detecting where coal dust is accumulating below the surface, railroads cannot realistically or practically identify all track locations where coal dust has accumulated to dangerous levels within the ballast.[10] Coal Shippers also overlook the

9 *See* UP Op. Ev. at 7; UP Op. Connell VS at 14; UP Reply Ev. at 6-7; BNSF Reply VanHook VS at 24; BNSF Reply Sloggett VS at 10.

10 *See* Connell Rebuttal VS at 3-4.

difficulty of inspection and evaluation based on the scope of track involved: 1,590 track miles on Union Pacific alone east of the Joint Line.[11]

While Mr. Nelson suggests the railroads use ground-penetrating radar (GPR) technology,[12] GPR is fairly new technology that is still in its experimental stage as a tool to detect ballast fouling in the United States.[13] GPR results are inconsistent; test results have been known to vary with rainfall and the nature and densities of contaminant particles. (McCulloch Rebuttal VS at 8.)

Union Pacific has begun testing GPR, but is not ready for widespread implementation. (Connell Rebuttal VS at 3-4.) In its testing, Union Pacific has experienced issues with respect to correlating the ballast fouling index with the actual amount of fouling, simplifying the data output so that maintenance employees can practically use it, and high processing time to obtain useful results. (*Id.*) Accordingly, GPR is hardly the proven technology that Mr. Nelson touts.[14]

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Coal dust's unique characteristics make it a particularly damaging foulant. And its significant impact deserves more attention than being brushed aside by shippers and associations as simply one of many substances that foul ballast and that can be managed the same way. Pound-for-pound, coal dust occupies more critical void space and does more damage. While concrete and granite fines are inevitable as ties and ballast wear out, coal dust is foreign and can be prevented from fouling ballast. But once coal dust

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11 Connell Rebuttal VS at 4.

12 AECC Reply Nelson VS at 8-9.

13 McCulloch Rebuttal VS at 8; Connell Rebuttal VS at 3-4.

14 McCulloch Rebuttal VS at 8. *Cf.* AECC Reply Nelson VS at 8-9.

penetrates the ballast, it accelerates the formation of concrete and granite fines and impairs drainage more, further accelerating the creation of concrete and granite fines. These negative characteristics of coal dust are compounded by the difficulty in locating all of the pockets where it has accumulated. Protecting ballast from coal dust in the first place a better way to preserve ballast integrity.

B. Coal Dust, Not Deferred Maintenance, Was the Critical Factor Behind the Joint Line Failure and Remains a Current Threat

This proceeding centers on whether BNSF may establish rules to prevent future coal dust emissions from railcars. Various shippers attempt to divert the Board's attention away from the fact that their trains deposit coal dust daily not only on the Joint Line but on rail lines hundreds of miles away from the PRB coal mines by obsessing on the cause of two Joint Line derailments that occurred more than five years ago. On reply, the Associations, Coal Shippers, and AECC maintain that the 2005 Joint Line derailments resulted from insufficient track maintenance and inspection.[15] The cause of the 2005 Joint Line derailments is ultimately irrelevant to this proceeding because the real question is what to do about coal dust now and in the future.

The shippers' alternative theories on why two trains derailed five years ago are not only irrelevant, however, they are also wrong. Both BNSF and Union Pacific have submitted testimony and extensive documentation about the events leading up to and the conditions on the Joint Line before and after the May 2005 derailments.[16] In addition,

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15 AECC Op. Ev. at 6-15; Associations Reply Com. at 4-8; AECC Reply Ev. at 9-13; Coal Shippers Reply Ev. at 6-7; Coal Shippers Reply Crowley VS at 2-3; Coal Shippers Reply McDonald VS at 1-3. *See also* UP Reply Ev. at 13 n.10 (providing references to deferred maintenance arguments in the parties' opening submissions).

16 UP Op. Ev. at 5-8; UP Op. Connell VS at 5-11; UP Reply Ev. at 13-16; BNSF Op. Ev. at 5-6, 9-10; BNSF. Op. Fox VS at 2-6; BNSF Op. Van Hook VS at 3-8; BNSF Reply Ev. at 14-15, Appendix A; BNSF Reply VanHook VS at 11-17.

both railroads have supplied extensive proof of why coal dust is an extraordinary threat to ballast, how loaded coal trains are emitting coal dust from the tops of cars, and why accelerated cycles of undercutting, switch repair and replacement and other ballast maintenance will be necessary if preventative measures are not taken.[17] We will not repeat all of that here. Instead we will focus on explaining why deferred maintenance could not have caused the derailments or the widespread failure of the Joint Line. Then we will address other alternative theories propounded by the shippers as to railroad failures, not coal dust, caused problems.

To buttress their claims of deferred maintenance, Coal Shippers carefully selected documents they claim prove that Union Pacific agrees that deferred maintenance by BNSF, not coal dust, was the culprit. Dennis Duffy, Union Pacific's Executive Vice President of Operations at the time, sets the record straight in his rebuttal statement. Union Pacific initially reacted to the derailments by blaming BNSF for failing to perform necessary maintenance on the track. It had never seen track deteriorate as quickly and over such an expanse as the Joint Line did in May 2005. (Duffy Rebuttal VS at 9.) Union Pacific's immediate reaction was driven by Union Pacific's strong sense of urgency to restore the Joint Line as soon as possible. "That urgency combined with our dependence on BNSF . . . and the limited information available at the time, caused us to jump to conclusions that we later realized were incorrect." (*Id.* at 9.)

After reflection, investigation and study related to the 2005 Joint Line Failure, Union Pacific concluded that BNSF properly maintained the Joint Line before the May

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17 UP Op. Ev. at 4-10; UP Op. Connell at 13-18; UP Reply Ev. at 3-12; UP Reply McCulloch VS at 4, 11; UP Reply Beck VS at 2-5; BNSF Op. Fox VS at 5-6, 8-9; BNSF Op. VanHook VS at 8-10, 15; BNSF Reply Ev. at 6-15; BNSF Reply VanHook VS at 2-11; BNSF Reply Sloggett VS at 8-10.

2005 derailments. We concluded that the Joint Line failure "was the result of a combination of coal dust in the ballast with heavy precipitation occurring over a short period of time after a sustained drought." (*Id.* at 10.)[18] Thus, "movement of loaded coal trains over track that was no longer properly supported by the ballast caused concrete ties to quickly fail and damage adjacent ties." (*Id.*)

Facts support the conclusion that BNSF did not defer maintenance:

- "[T]here were no track-caused derailments on the Joint Line in the years preceding the two May 2005 derailments";
- Prior to those derailments, "record volumes of coal moved on the Joint Line in the first quarter of 2005";
- We should have seen a high number of slow orders on the Joint Line in 2004 and early 2005 "if there were latent defects from deferred maintenance," which we did not see; and
- FRA Joint Line inspections in October 2004 and early May 2005 did "not reveal an unusual number of track structure-related defects which one would expect if there were deferred maintenance."

(Duffy Rebuttal VS at 11; *see also* UP Reply Ev. at 15-16; BNSF Reply VanHook VS at 19.)

AECC and Coal Shippers also suggest other related railroad failings as the reason for the accumulation of coal dust on track. For example, Mr. De Berg and Mr. McDonald both suggest that the Joint Line's track structure was under-designed and railroads were unwilling invest in additional capacity and maintenance to keep up with the increasing demand.[19] But those theories are unsupported by the facts. Union Pacific anticipated the

18 *Cf.* BNSF Reply VanHook VS at 12 ("After studying the circumstances of the derailments, BNSF concluded that the presence of coal dust in the ballast combined with severe weather conditions in Wyoming in May 2005 contributed to the two derailments that occurred on the Joint Line.").

19 AECC Reply De Berg VS at 4-5; Coal Shippers Reply Ev. at 4.

growth in the annual volume of SPRB coal moved and "planned successfully for it:" we spent over $1.1 billion on infrastructure capacity additions and $5 billion on maintenance associated with coal between 1999 and 2009.[20] Union Pacific also has a "robust track evaluation and preventive maintenance program to identify rough track, turnouts and bridge approaches."[21] And Union Pacific implemented all capacity expansion recommendations made by CANAC on schedule or earlier.[22]

Nor, as Mr. Connell explains, did the Joint Line lack sufficient capacity to perform maintenance. In particular, Mr. McDonald's criticism that in 2005 the Joint Line was only double-track with a short segment of triple track, while Union Pacific east of Shawnee Junction had double track for half the volume, was wrong both on respective capacity and the relative densities. The Joint Line had three tracks from its southern end to north of Nacco, or 59 miles, which comprised its highest densities. And the Joint Line segments that were then double track had lower densities than Union Pacific.[23]

C. Shippers' Deferred Maintenance Argument Is a Red Herring: Substantial Coal Dust Accumulations on Union Pacific's Lines Hundreds of Miles from the Joint Line Illustrate Coal Dust Proliferation Issues

Consistent with Union Pacific's proactive, safety-first philosophy, it has devoted substantial resources to building, maintaining, and safely and efficiently operating its own lines that transport SPRB coal from the Joint Line. Here, no one has identified

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20 Duffy Rebuttal VS at 2; *see also* Connell Rebuttal VS at 5.

21 Connell Rebuttal VS at 2; *see* Duffy Rebuttal VS at 7.

22 Connell Rebuttal VS at 5. Mr. McCulloch similarly concludes that the Joint Line track was designed and constructed in accordance with standards recognized by AREMA (American Railway Engineering and Maintenance-of-Way Association) and its predecessor. (McCulloch Rebuttal VS at 10.)

23 *See* Connell Rebuttal VS at 6.

short-comings in Union Pacific's track design. Union Pacific has installed "premium materials such as head-hardened rail and concrete ties" on its SPRB coal corridors because "such components last longer under the heavy weights and volumes."[24] And it continually seeks out "new and better ways to build and maintain the heavy-haul railroad."[25] Nor do shippers and associations challenge Union Pacific's maintenance efforts on its SPRB coal corridor extending from the Joint Line.

But despite Union Pacific's efforts, coal dust has accumulated at substantial rates on those lines. AECC and Associations conveniently ignore Shannon & Wilson's documentation of significant coal dust deposits on Union Pacific's main lines as far as 600 miles from PRB mines. (*See* Connell Rebuttal VS at 1-2; UP Reply Ev. at 16; UP Op. Ev. at 8; UP Op. Connell VS at 17.)[26] Even though these lines are hundreds of miles away from the PRB mines and move less coal than the Joint Line, too much coal dust is accumulating.[27] "Troubling accumulations of coal dust" were found at many locations that did not involve either switches or bridges. (Connell Rebuttal VS at 1-2.)[28] Unless coal shippers implement measures to prevent coal dust emissions, the continuing accumulation of coal dust threatens the safe and efficient transportation of all types of

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24 Duffy Rebuttal VS at 6; Connell Rebuttal VS at 6-7.

25 Duffy Rebuttal VS at 7; *see also* Connell Rebuttal VS at 4-8.

26 Coal Shippers concede that [redacted] (Coal Shippers Reply Ev. at 15.)

27 BNSF also noted coal dust deposits "on lines hundreds of miles outside of the PRB." (BNSF Reply Ev. at 13.)

28 Not to mention that a major cause of switches and bridges becoming rough is not improper operations, track design, or maintenance, but "coal dust falling out at those locations and fouling the ballast." (Connell Rebuttal VS at 3.)

goods moving on those Union Pacific lines. (*See* Duffy Rebuttal VS at 5, 8; UP Reply Glass VS at 6-7; UP Op. Connell VS at 17-18.)

II. The Best Approach Is to Prevent Coal Dust from Falling from Railcars Before it Is Deposited on and near the Track

A. Shippers Should Keep their Coal in the Cars

Coal shippers should keep their coal safely and securely in the car during transport, similar to the responsibility of shippers of all other commodities.[29] The DOT agrees that owners of the product have a responsibility "to package or load the product so that it remains within the equipment being used for transport, especially if at some point consequences emerge." (DOT Reply Com. at 5.) As explained above, it is well known and documented that coal dust has adverse consequences on ballast integrity and track stability.

Although railroads are responsible for maintenance of their infrastructure, "the properties of coal dust and the amounts in which it escapes in the PRB region add an element beyond normal wear and tear for which the owners of the coal dust are properly responsible." (DOT Reply Com. at 5-6.) Similarly, "[b]ecause the shippers do not load their property so that it does not escape from the coal cars in the first place, the failure to do so should make them responsible to pay for the most cost-effective incremental mitigation measures." (DOT Reply Com. at 7-8; *see also id.* at 2.)

Railroads have the right to "reduce or limit the accumulation of [its customer's] coal dust on its track structure and related land." (CSXT Reply Com. at 5.) Shippers and

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29 DOT Reply Com. at 2 (suggesting shippers should secure their property for transport as a matter of course); *see* UP Op. Ev. at 10-12; *see also* CSXT Reply Com. at 5-6; BNSF Reply Ev. at 15 ("BNSF does not let any other shipper's freight spill out of the car onto the railroad's right of way . . .").

Associations desperately try to distinguish the cases cited in support of a railroad's discretion to adopt operational or tariff rules, simply suggesting that none of those cases specifically address coal dust emissions and are therefore factually distinguishable. (*See* Coal Shippers Reply Ev. at 23-24; AECC Reply Ev. at 4-7). But 49 U.S.C. § 10704(a)(1) without question allows railroads to establish reasonable rules.[30] Shippers also comment that the existence of loading rules for other commodities is irrelevant (because each rule must be judged on the facts of each particular case). (Coal Shippers Reply Ev. at 25-26.)

The only justification that they offer for why they—unlike any other rail shipper—should not be responsible for securing their lading in the cars is that they have shipped coal for 100 years without the BNSF rule. But when circumstances change, the Board has found that the adoption of new tariff rules is reasonable. *See N. Am. Freight Car Ass'n v. BNSF Ry. Co.,* STB Docket No. 42060 (Sub-No.1) (served Jan. 24, 2007). Circumstances have changed. It is unprecedented for any railroad to attempt to maintain an aggressive 3 to 6 year undercutting cycle for high-density rail corridors that handle in excess of 300 MGT[31] and average more than 100 trains a day. Recent scientific research has established that coal dust is an extraordinarily pernicious foulant that can cause serious damage to track when wet.

Similarly, shippers suggest (with little if any legal support) that they have no responsibility for loading their coal in a way that prevents their coal from escaping by arguing that railroads are solely responsible for the products during transport. (Coal

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30 *See* AECC Reply Ev. at 6. *Cf.* Coal Shippers Reply Ev. at 25 ("[C]arriers can adopt reasonable rules governing safe loading of rail cars.").

31 In 2009, the Joint Line handled nearly 400 MGT on some segments. Union Pacific's central corridor in Nebraska handled 380 MGT.

Shippers Reply Ev. at 24-25; AECC Reply Ev. at 5; Associations Reply Com. at 3-14.)[32] Here, shippers are fully aware that their coal will escape from rail cars,[33] many owned by them, during normal railroad transportation operations, regardless of any preventative steps that a railroad could feasibly make.

And the accumulation of coal dust on the right-of-way is immediately distinguishable from the various hypothetical scenarios offered by shippers, such as product spillage resulting from a derailment, where ordinarily the railroad will be considered responsible unless shipper negligence in loading or maintaining the car can be established. (Associations Reply Com. at 3.) Like the sifting of grain from bulk grain cars without grain doors during transport, which was an "incident of loading bulk grain,"[34] coal dust emissions during transport of coal-loaded open-top cars without the use of preventative loading measures (such as spraying, compaction, or covers) are an "incident of loading coal." (*Cf.* AECC Reply Ev. at 6.) Likewise, the example of a homeowner and truck who spills dirt on the road is distinguishable from the factual circumstances in this proceeding. (Associations Reply Com. at 3.) The homeowner relies

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32 Although Coal Shippers comment that railroads have a responsibility to provide safe cars so that the goods can be transported in a safe manner (Coal Shippers Reply Ev. at 26-27), that statement is not relevant to the Board's determination of the reasonableness of BNSF's tariff rules. No one (including DOT) stated or suggested that coal cars are not safe or that railroads are not transporting PRB coal safely. *See* DOT Reply Com. at 2-3 (stating it "has no objection to BNSF's tariff rule from a safety perspective). Also, Coal Shippers overlook the fact that in the majority of the time, shippers provide their own cars. In that situation, shippers voluntarily assume the railroad's obligation to provide safe cars. Finally, DOT's position is that coal owners have a responsibility "to package or load the product so that it remains within the equipment being used for transport." (DOT Reply Com. at 5.)

33 Even Coal Shippers concede that "[t]he type of coal, and how the coal is profiled in a coal car, may impact the amount of coal that is emitted under specified rail operations conditions." (Coal Shippers Reply Ev. at 25 n.16.)

34 *See Chicago Bd. of Trade v. Abilene & S. Ry. Co.*, 220 ICC 753 (1937).

on the truck owner to load the truck. Coal shippers (and all carload rail shippers), by contrast, are responsible for loading railcars. (*See* Uniform Freight Classification 6000-M, Rule 27.)

But coal shippers are not entitled to special status or treatment: "[S]hippers of virtually every other product of which DOT is aware take steps to ensure that their property remains intact in or on rail cars during transport, either because the property has inherent value and/or because it can cause operational, safety or other consequences. (*See* DOT Reply Com. at 5.)[35] Shippers fail to present a sound basis for why coal should be treated differently than all other transported products—especially when relieving them of the responsibility for keeping their coal in their cars would be detrimental to service received by numerous Union Pacific customers who share the same lines. (*Id.* at 5 and n.5.)[36]

B. Adhering to the Status Quo as Suggested by Opponents of BNSF's Tariff Rules Would Ignore the Development of New Technologies and the Application of New Information Learned Based on Past Experiences

Shippers and various associations suggest that railroads should continue to remove accumulating coal dust because "that's what always has been done." (Coal

35 Associations state that their member shippers are not involved in the loading of coal purchased by them. (Associations Reply Com. at 4.) While they may not physically load the coal, they own it and should be able to dictate loading practices pursuant to purchase agreements with producers. Somewhat inconsistently, Associations separately comment that they have complied with railroad loading requirements in the past. (*Id.* at 3.) Moreover, while numerous coal shippers are objecting to the BNSF rule, no producer is participating in this proceeding. If, as Associations state, the shippers have no involvement in loading practices, one would expect the situation to be reversed.

36 *See also* CSXT Reply Com. at 5 (stating it "knows of no inherent right on the part of a customers to leave unrestricted portion of its property on its supplier's land).

Shippers Reply Ev. at 5, 25-27; AECC Reply Ev. at 6.)[37] There are several flaws in this argument. First, shippers ignore that they have a responsibility to keep their product secure. (*See* DOT Reply Com. at 5; Uniform Freight Classification 6000-M, Rule 27.) Second, what may have been acceptable before may not be at a later point in time based on changed circumstances, new knowledge, or scientific advances. *See N. Am. Freight Car Ass'n v. BNSF Ry. Co.,* STB Docket No. 42060 (Sub-No.1) (served Jan. 24, 2007) (concluding that changed circumstances require different rules).[38] And just because PRB coal historically has been transported in open-top cars without efforts to limit coal dust emissions does not mean that modifications to that practice going forward are not reasonable. (*See* CSXT Reply Com. at 4, 6; *see also* UP Reply Ev. at 16 n.12.)[39]

C. Preventing Problems Delivers Better Service and Efficient Operations Than Fixing Problems

Union Pacific strives to be proactive in all aspects of its operations, showing its commitment to customers and minimizing the risks that potential issues could later become significant problems. (*See* Duffy Rebuttal VS at 1, 6-8.) No sound reasons warrant treating coal dust different from other railroad operational issues. As Mr. Duffy explains, "[o]ur interest in seeing coal shippers take steps to maintain their lading within

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37 *See also* TUCO Op. St. at 4; Coal Shippers Op. Ev. at 14-15.

38 For example, Union Pacific's addition of double, triple and quadruple track to its lines in recent years may lead to increased coal dust fouling in track ballast. Where there are multiple tracks, "coal dust from a train on a westerly track has the potential to be carried by the wind to adjacent downwind tracks, leading to accelerated fouling" instead of being blown "to the east and deposited alongside or away from the track structure. (McCulloch Rebuttal VS at 8-9.)

39 *See also* CSXT Reply Com. at 4 ("Adopting beneficial changes in technology or practices should not be unduly hampered by obsolete past practice.").

their railcars is consistent with our overall approach as a company both for our own actions and shipper activities that affect transportation" on our lines. (*Id.* at 2.)

1. Union Pacific is committed to coal and has engaged in significant capital improvement projects.

Union Pacific's proactive efforts have been "critical to growing with our coal customers to move unprecedented levels of tonnage while also improving cycle times. (Duffy Rebuttal VS at 1-2.) In the last ten years, Union Pacific has made substantial expenditures, technological advancements and operational changes in its commitment to grow with and serve our Energy customers. (*Id.* at 2-3.) Examples include:

- Over $1.1 billion in infrastructure capacity additions and nearly $1.1 billion in locomotive investment for the Energy business from 1999-2009;
- Additional $5+ billion in maintenance capital investments associated with coal from 1999-2009;
- Capacity improvements in the form of additional double, triple and quadruple track on the Joint Line and Union Pacific's SPRB coal corridor; and
- In connection with upgrading its coal open-car hopper fleet, Union Pacific spent $2.4 million repairing gates to prevent coal from leaking out the bottoms.

(*Id.* at 2-4, 7, 9 n.7; UP Reply Ev. at 11-12; UP Reply Beck VS at 8.) These investments enabled Union Pacific to "grow the SPRB coal operation to a record level of 205 million tons in 2008" and improve train velocity that same year to 23.5 mph. (Duffy Rebuttal VS at 4.) (Connell Rebuttal VS at 5.)

2. Union Pacific conducts efficient and regular inspection and maintenance on its coal lines.

Mr. Duffy explains that Union Pacific's top priority is running its railroad safely, which benefits customers by "improving the reliability of our service to them and by protecting their property from damage." (Duffy Rebuttal VS at 6.) Union Pacific has added track to increase capacity and facilitate maintenance as well as increased train size, which creates additional capacity by moving more coal with fewer trains. (Connell Rebuttal VS at 5-7.) Associated with running its railroad safely, Union Pacific tries to minimize the risk of derailments and reduce slow orders (which permit safe rail operations when track defects exist, but "at the expense of service and velocity"). (Duffy Rebuttal VS at 6.) Union Pacific strives to achieve those goals through proactive measures including good track design,[40] and regular inspections and maintenance. (*Id.* at 6-8.)

For example, Union Pacific plans ahead for preventative maintenance to avoid track outages and slow orders. (*Id.* at 7.) It also builds 20-foot track centers so that maintenance can be safely performed while trains continue to move on adjacent tracks. (*Id.*; Connell Rebuttal VS at 6.) With respect to inspections, it uses rail detector and geometry cars to identify minor defects before they become major concerns. (Duffy Rebuttal VS at 7; Connell Rebuttal VS at 7-8.) And it both works with customers to promote safe loading practices and takes numerous steps to prevent leaking coal cars. (Duffy Rebuttal VS at 8; UP Reply Ev. at 11-12; UP Reply Beck VS at 5-8.)[41]

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40 *See supra* Parts I.B and I.C.

41 Coal Shippers misstate Union Pacific's position regarding its inability to unilaterally prevent emissions through loading actions. (*See* Coal Shippers Reply Ev. at 27 n.24.) Union Pacific commented that railroads cannot enter into agreements with the mines regarding how they load coal for their customers because the coal is neither Union Pacific's nor in its control at the time. (*See* UP Op. Ev. at 12.) But we are willing to communicate and informally work with our customers on ways to improve loading practices, and are working on systems to provide timely information about how trains load. (UP Op. Ev. at 21-22; UP Op. Glass VS at 10-11.)

D. Increased Maintenance Is Not a Sustainable Solution

1. Three to six-year undercutting cycles are not sustainable or the best solution.

Mr. Connell previously explained that Union Pacific would need to undercut 265 miles each year on its lines and deploy one to two undercutting gangs for the entire 214 day maintenance season in order to successfully undercut all lines every 3 to 6 years. (UP Op. Connell VS at 17-18; *see also* UP Reply Ev. at 5; UP Reply McCulloch VS at 2, 3.) And Mr. Nelson suggests that a 3-5 year undercutting cycle is appropriate (at least as of 2005) based on movement volumes on the Joint Line. (AECC Reply Nelson VS at 10.) Coal Shippers and AECC both conclude without digging into details that the estimated annual coal dust removal efforts are easily manageable. (Coal Shippers Reply Ev. at 9-10; AECC Reply Nelson VS at 10.) But a 38-person gang can undercut at most 1.5 miles per day (where track is not returned to operations at night) and, due to seasonal weather issues, can only be deployed seven months out of the year. (Connell Rebuttal VS at 4.)

This is not sustainable over the long term,[42] and such increased maintenance will impact capacity and service for all customers (despite Union Pacific's proactive efforts to grow with its customers and meet their needs.) (*See* Duffy Rebuttal VS at 7 n.2, 12; UP

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[42] Mr. Crowley suggests that the railroads can easily accommodate increased undercutting and maintenance by commenting that BNSF and Union Pacific has already been performing increased maintenance and their velocity is higher. (Coal Shippers Reply Crowley VS at 8-9; *see* Coal Shippers Reply McDonald VS at 4.) But Mr. Crowley doesn't acknowledge that Union Pacific has added capacity at substantial cost, while the decline in traffic in 2009—due to the economy—helped to boost velocity. (*See* Duffy Rebuttal VS at 4; Connell Rebuttal VS at 4-6.) Mr. Crowley also failed to consider what will happen when traffic volume is restored to 2008 levels.

Op. Ev. at 8-9; UP Op. Connell VS at 17-18.)[43] Not only does the stealthy nature of coal dust create difficulties with identifying all track locations where it has accumulated, but it also creates enormous uncertainty for railroads when developing preventative track maintenance programs.

As explained more completely by Union Pacific's Dennis Duffy, "[e]ven an aggressive, out-of-face undercutting program is uncertain of reaching all concentrations soon enough to prevent track damage and slow orders due to the variation in where dusting episodes occur and how coal dust accumulations can be concealed by a clean surface." (Duffy Rebuttal VS at 8; *see* Connell Rebuttal VS at 3-4.) And as Mr. McCulloch describes, "[u]ndercutting strictly on the basis of time or cumulative tonnage based on current emission levels means that much of the track might not actually require the accelerated undercutting, but the risk of the coal dust getting wet in so many locations would mandate removal of the coal dust anyway at great expense and disruption of traffic." (McCulloch Rebuttal VS at 8; *see* Connell Rebuttal VS at 3.)

Coal Shippers (Mr. McDonald) and AECC (De Berg) both conclude that the railroads have a responsibility to build more capacity if the required maintenance activity disrupts rail service. (*See* Coal Shippers Reply McDonald VS at 4; AECC Reply Ev. at 24-25; AECC Reply De Berg VS at 4-5.) But building more track simply for the purpose of performing more maintenance is not practical or efficient. Additional track will need to be inspected and maintained, and may increase the likelihood of coal dust

43 Union Pacific's experience is not unique. BNSF also explains that its increased coal dust-related maintenance "efforts consume limited resources and track capacity and are not a practical solution over the long term." (BNSF Reply Sloggett VS at 10; *see generally* BNSF Reply Smith VS (addressing coal dust's impact on railroad operations).)

accumulation on and near the track. (Connell Rebuttal VS at 7; McCulloch Rebuttal VS at 9.)

Thus, it is more effective to prevent the coal dust emissions before they accumulate on the track and roadbed. This type of approach is consistent with Union Pacific's overarching philosophy of preventing potential problems before they actually arise and its primary objective of running a safe railroad operation. (Duffy Rebuttal VS at 8.)

2. Coal dust emissions impact Union Pacific's non-coal customers.

Confirmation by Shannon & Wilson that coal dust has accumulated on Union Pacific line hundreds of miles from PRB mines substantially changes the dynamic of the PRB coal dust situation.[44] Because significant coal dust accumulation extends to Union Pacific's SPRB's coal lines on "major rail corridors that serve the entire western United States," Union Pacific's non-coal customers will be impacted by detrimental effects of coal dust accumulation, such as ballast fouling and inefficiencies resulting from coal dust cleanup. (Duffy Rebuttal VS at 5.) Coal traffic mixes with a wide variety of non-coal traffic on those lines, including intermodal, agricultural, chemicals, auto, and industrial products customers. (*Id.*)

While arguing that undercutting and other maintenance activities sufficiently remedy any issues associated with coal dust accumulation, shippers ignore the interests of non-coal customers, who are not responsible for any of the coal dust accumulation. Just addressing Union Pacific's Central Corridor through North Platte, Union Pacific "moves more than 6,000 freight cars and intermodal shipments daily in addition to its coal

44 *See* UP Reply Ev. at 12; UP Op. Ev. at 7-8; UP Op. Connell VS at 16-17.

movements on that corridor. (*Id.* at 5.) These customers depend on Union Pacific to provide safe and efficient rail service that is critical to "connecting West Coast points, the major eastern gateways and numerous states in between." (*Id.*; *see* UP Reply Ev. at 18-19; UP Reply Glass VS at 6-7.) While these customers are not responsible for any of the coal dust accumulation, because they share the rails with coal customers, "their service and equipment utilization will deteriorate if Union Pacific must undercut 265 miles of track year-in and year-out in order to keep up with coal dust" deposits. (UP Reply Glass VS at 6-7.)

Undercutting, shoulder cleaning, and switch cleaning and replacement burden non-coal shippers who are not responsible for the underlying coal dust accumulation. Non-coal shippers would have their trains delayed even though they secure their lading. Nor does cleaning up coal dust on Union Pacific's right-of-way address the consequences of open-top car coal dust emissions that end up beyond the railroad's right-of-way. (Duffy Rebuttal VS at 8-9.) Therefore, the best approach is for shippers to prevent coal dust emissions in the first place before they present problems for safe and efficient rail transportation.[45]

III. Shippers Should be Financially Responsible for Keeping their Coal in the Railcars

The DOT agrees with Union Pacific and BNSF that shippers should be financially responsible for the incremental costs of dealing with coal dust. (*See supra* Part II.A.) But shippers have not paid for maintenance costs associated with coal dust removal.

[45] Although all coal dust cannot be eliminated, "any reduction will result in a reduction of the excessive maintenance currently required." (McCulloch Rebuttal VS at 1, 7 (responding to comment from Mr. Nelson that there is no viable way to eliminate all fugitive coal dust).)

Coal Shippers and Mr. Crowley's analysis of Union Pacific's rates, variable costs and contribution is incomplete, flawed, and based on improper assumptions.

Mr. Crowley incorrectly concludes that although Union Pacific has incurred increased maintenance requirements, its rail rates generated increased revenues sufficient to cover both those additional maintenance costs and to increase contribution above variable costs. (Coal Shippers Reply Ev. at 10; Coal Shippers Reply Crowley VS at 2-3, 5-7.) In concluding "that Union Pacific earns enough on its coal traffic to absorb additional and avoidable costs to remove coal dust," Mr. Crowley:

- Misstated Union Pacific's revenue associated with SPRB coal;
- Misstated Union Pacific's variable costs associated with SPRB coal; and
- Overstated the contribution available to support the Union Pacific's coal network.

(Draper Rebuttal VS at 1.)

First, Mr. Crowley overstated Union Pacific's SPRB coal revenue. (*Id.*) He calculated Union Pacific's total number of tons and revenue associated with coal in the United States, even though SPRB coal "accounts for no more than 74% of Union Pacific total carloads" from 2005 through 2008. (*Id.* at 2.) And with respect to revenue-ton miles, Mr. Crowley includes not only coal tons associated with areas other than SPRB, he includes data on all commodities that Energy Marketing handles (including coke). (*Id.*)

Second, Mr. Crowley inappropriately adjusted Union Pacific's coal variable costs downward by 17%, overstating Union Pacific's contribution on coal by 86%. (*Id.* at 2-3.) Mr. Draper explains that Mr. Crowley should not have relied on a decision in the 2002 WPL rate case on "the variable costs for [WPL] traffic moving in 2000" because there is no showing that the 2000 variable costs are representative of traffic during 2005 through

2008; there is no showing that the WPL movement to Sheboygan, Wisconsin was typical of SPRB traffic; and that since 2005, the Board has rejected the Speed-Factored Gross Ton adjustment to maintenance-of-way costs as a reliable methodology (which was applied in the WPL case) and now employs a system average Uniform Railroad Costing Systems (URCS) calculation. (*Id.* at 2-5.)

Had Mr. Crowley not used the WPL Decision adjustment, his $3.74 billion estimated cumulative contribution from Union Pacific coal would be reduced by 46% to $2.01 billion. And this estimate is still overly inflated because it includes "all coal and coke moved by Union Pacific," instead of only Union Pacific's SPRB coal movements. (*Id.* at 5.)

Finally, Union Pacific's coal contribution is not sufficient to cover fixed costs. Therefore, Union Pacific is recovering less than its full cost for track maintenance. Mr. Draper explains why Mr. Crowley' contrary analysis is wrong:

> Specifically, Mr. Crowley states that "[t]he contribution in [his Table 1] is calculated *after* the railroads have covered the costs to perform the maintenance activities and paid for the incremental road property investment required for the high volume of coal...". (emphasis added). As an experienced railroad cost analyst, Mr. Crowley knows, or should know, that URCS assigns half of road investment capitalized roadway maintenance to fixed costs and excludes it from variable costs. The 50% variability assigned to road property return (which includes capitalized maintenance as well as the original installation) makes his statement literally untrue.

(*Id.* at 5-6.) Furthermore, contribution refers not to profit but to the difference between revenue and variable costs, and that difference is applied to fixed costs. (*Id.* at 6.) "Railroad fixed costs account for a significant share of our total costs." Based on the 2008 URCS application for Union Pacific, a 132% revenue-to-variable cost ratio would have been necessary in aggregate to recover both variable and fixed costs. Yet the aggregate revenue-to-variable cost ratio for coal was only 119%. Moreover, publicly available information shows that Union Pacific has consistently failed to "recover its full investment costs" during the years 2005 through 2008, inclusive. (*Id.* at 6-7.) In fact, Union Pacific's return on investment compared to railroad cost-of-capital results in a cumulative shortfall of $2.6 billion for the years 2005 through 2008. (*Id.*)

IV. The Board's Ruling in this Proceeding Concerning the Reasonableness of BNSF's Tariff Rules Should Not Interfere with Union Pacific's Efforts to Work with Customers on Coal Dust Solutions

A. Board's Ruling Should Not Disturb a Railroad's Right to Adopt and Implement Reasonable Rules and Practices to Promote Safe and Efficient Rail Transportation

As Union Pacific has previously explained, railroads have the authority to adopt rules and practices that promote safe, reliable and efficient rail transportation. 49 U.S.C. § 10702(2) (*see also* UP Op. Ev. at 10-11.)[46] The Board's ruling in this proceeding should not erode that railroad authority; railroads need the flexibility, particularly as scientific learning and circumstances change, to implement operational and loading practices to ensure that rail freight moves safely and efficiently.[47] Consistent with this statutory right, the Board should permit railroads to adopt reasonable rules to prevent coal dust emissions from open-top rail cars and the accumulation of coal dust on and near the

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[46] *See* CSXT Reply Com. at 3 (stating it has "established and published numerous common carrier rates, conditions of carriage, rules and operation requirements that govern shipments on its network," many of which "are essential to safety and efficient rail operations").

[47] *See, e.g.,* NS Reply Com. at 3 (stating that railroads need "discretion to adopt appropriate tariff provisions in different factual circumstances"); CSXT Reply Com. at 3-5 (stating that the Board should "ensure that railroads retain their statutory right to adopt and implement reasonable tariff provisions requiring the adoption of new technologies and practices to continue to enhance the safety and efficiency of railroad operations").

track. Further, DOT explains that FRA ballast rules[48] are performance-based, and BNSF may ensure the ballast performs its required functions in a variety of ways, including shipper profiling and spraying. (*See* DOT Reply Com. at 3-4.)

Coal Shippers request that "the Board require BNSF to demonstrate, using sound science, the amount and sources of coal dust and other contaminants that are in the ballast on the involved lines, whether this distribution is uniform, and whether achievable reductions in coal dust emissions from the top of cars will realistically reduce the time and costs to address ballast maintenance" all "before permitting BNSF to promulgate any coal dust emission rules[49] is unreasonable and inappropriate. Requiring that the reasonableness of railroad rules be determined before they are effective unduly interferes with railroads' rights and responsibilities. *See* 49 U.S.C. § 10702 ("A rail carrier . . . shall establish reasonable . . . rules and practices related to that transportation or service.")[50] Therefore, as CSXT emphasizes, the Board should reconfirm that "the rules adopted by a railroad are effective, absent a finding by the Board that they are unreasonable." (CSXT Reply Com. at 4-5; *see also* NS Reply Com. at 3-4.) Even AECC apparently agrees with this point. (*See* AECC Reply Ev. at 7 (agreeing that "railroads are not required to seek Board approval of proposed rules before putting them into effect.").)

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48 *See* 49 C.F.R. § 213.103; 49 C.F.R. § 213.334.

49 Coal Shippers Reply Ev. at 16 (emphasis added). Similarly, Associations suggests that the Board must first find BNSF's tariff reasonable before it may be permitted to go into effect. (Associations Init. Com. at 6, 7.)

50 *See* NS Reply Com. at 3-4 (concluding that such a requirement "violates the language and policy of the Interstate Commerce Act").

B. Board's Ruling Should Be Narrowly Limited to the Reasonableness of BNSF's Tariff Rule and its Current Provisions

The Board should evaluate the reasonableness of railroad rules, practices and tariffs on a case-by-case basis, being careful not to make broad statements that may discourage the adoption of other railroad rules and practices based on different circumstances or rationales. As NS notes, the Board should take care to specify that "its decision in this case . . . is limited to those facts so as not to unduly limit carriers' discretion to adopt appropriate tariff provisions in different factual circumstances." (NS Reply Com. at 3; *see also* CSXT Reply Com. at 2.)

Although most parties endorse a case-by-case approach,[51] applying theory to practice is another matter. While AECC comments that "the reasonableness of [Union Pacific's] initiatives will not be affected by any determination that the BNSF tariff is unreasonable" (AECC Reply Nelson VS at 15), the variety of larger issues substantively addressed by the parties ranging from the danger and impact of coal dust, to which party should bear responsibility for coal dust falling out of railcars, to preferred methods for addressing coal dust, and to the claimed detailed components of rail rates (which are beyond the scope of the notice in this proceeding),[52] could undoubtedly impact Union Pacific's current and future efforts to collaborate with customers on coal dust solutions.

Union Pacific believes that collaborative approaches to solving rail transportation issues can be successful based on our past experiences, and the Board's decision should not interfere with or discourage Union Pacific's efforts to work with customers and mines

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51 *See, e.g.,* AECC Op. Ev. at 4; Coal Shippers Op. Ev. at 11; BNSF Op. Ev. at 20; NS Op. Com. at 1; NS Reply Com. at 1-3; Associations Reply Com. at 2; CSXT Reply Com. at 2, 3.

52 UP Reply Ev. at 22.

on coal dust prevention. (*See* UP Op. Ev. at 20-23.)[53] A ruling that BNSF's tariff rules are unreasonable in one or more respects, particularly if coupled with broad language or specific, narrow conclusions regarding the scope of reasonable coal dust prevention measures and related enforcement provisions, will discourage ongoing communications and collaboration among railroads, producers and shippers regarding coal dust prevention.[54]

V. Responses to Other Points Raised by Parties Opposing BNSF's Coal Dust Tariff Rules

A. The Dismissal of Union Pacific' Tort Claims in Earlier Civil Litigation Is Irrelevant to the Issues Raised in this Proceeding

Coal Shippers go to great lengths in arguing that the railroads' point that shippers should be responsible for keeping their coal in the cars is without merit—they even cite a state court's dismissal of tort claims as if it were controlling authority on the STB in implementing the ICCTA.[55] But the claims in that civil case are distinguishable and of no effect in this proceeding. Furthermore, as previously discussed, the DOT concludes that shippers have a responsibility to load their coal so that it stays within the car during transport. (DOT Reply Com. at 5-6, 7-8.)

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53 The Associations contend that Union Pacific is attempting to introduce foreign issues into this proceeding because of the chilling impact that such claims would have on other rules. (Associations Reply Com. at 2.) That is not true. Union Pacific's concern is that either overbroad or over-restrictive language relating to BNSF's coal dust rule could hamper Union Pacific's efforts to develop and implement its own coal dust program with its customers. Union Pacific merely used its car maintenance program as an example of how rules can evolve during the course of collaborative communication.

54 *Cf.* Associations Reply Com. at 3-4 (preferring communications among customers, railroads and producers in an effort to adopt mutually agreed-upon solutions).

55 *See* Coal Shippers Reply Ev. at 22-23; *see also* Associations Reply Com. at 14 (arguing that BNSF's argument is "another variation on UP's discredited 'trespass theory.'"). *Cf.* AECC Reply Ev. at 1-4 (arguing that shippers are not trespassers under tort law).

The earlier civil litigation in question began as a simple declaratory judgment action when Union Pacific asked the court to address its right to declare force majeur under a contract. Only after defendants (represented by Coal Shippers' counsel in this proceeding) broadened the case by filing a negligence tort claim against Union Pacific,[56] alleging that the 2005 derailments were the result of Union Pacific's failure to remove or prevent coal dust from accumulating on the Joint Line track and roadbed, did Union Pacific respond by asserting tort claims. Ultimately, Judge Fox dismissed <u>all</u> parties' tort claims (a fact not mentioned by Coal Shippers).[57]

Additionally, Union Pacific's tort claims in the *Entergy* litigation were for historical damages. This case presents a much different scenario. Here, BNSF and Union Pacific each anticipate increased future coal dust removal costs as the result of shippers' coal falling out of the open-top rails cars during transportation. And each argue that railroads should be permitted to adopt reasonable loading, operational and tariff rules that address the prevention of coal dust emissions.

B. Union Pacific Believes the BNSF Coal Dust Standards Are Justified and Beneficial, But Recognizes Limitations on Applying the Standards

AECC and Coal Shippers suggest that Union Pacific supports BNSF's tariff rule, but only so long as the rule does not apply to Union Pacific or its customers. (Coal

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56 *See* Answer and Counterclaim of Entergy Arkansas, Inc. and Entergy Services, Inc. (April 11, 2006), *Union Pacific Railroad Company v. Entergy Arkansas, Inc., et al.*, Case No. CV2006-2711 (Circuit Court of Pulaski County, Arkansas, Sixth Division) [attached as Counsel Ex. 8].

57 *See* Judge Fox's Order Granting in Part and Denying in Party Union Pacific's Railroad Co.'s Motion for Partial Summary Judgment (March 3, 2008) at 1 (granting Union Pacific's motion for summary judgment on defendants' tort counterclaims), *Union Pacific Railroad Company v. Entergy Arkansas, Inc., et al.*, Case No. CV2006-2711 (Circuit Court of Pulaski County, Arkansas, Sixth Division) [attached as Counsel Ex. 9].

Shippers Reply Ev. at 3; AECC Reply Ev. at 28-29.) Union Pacific believes that BNSF's coal dust standards would reduce coal dust emissions and promote safe, efficient and reliable transportation. But Union Pacific also recognizes that, as a matter of law, the BNSF tariff standard can only apply to BNSF common carrier customers. BNSF tariff rules cannot apply to Union Pacific contract or common carrier customers and, depending on the terms of the specific contracts between BNSF and its customers, may or may not apply to BNSF contract customers. It is not a matter of Union Pacific's preference or choice. It is the nature of the legal relationships between the various Joint Line stakeholders that determines the applicability of the BNSF tariff rules in question.

But one more legal wrinkle exists that impacts the applicability of the BNSF standard to Union Pacific trains. BNSF adopted a similar operating rule at the beginning of 2009. Unlike a tariff rule that applies only to BNSF common carrier customers, however, BNSF's operating rule promulgated for the Joint Line applies to Union Pacific under the Joint Line Agreement approved by the ICC in 1982. (UP Op. Ev. at 2, 18; Connell VS at 3-4.) The operating rule is not at issue in this proceeding. (UP Op. Ev. at 18-19.) But the existence and the applicability of the operating rule is relevant to a question that AECC raised: can BNSF prevent AECC trains from operating over the Joint Line?

Answering AECC's allegation is more difficult. Partly because the answer depends on § 10709 contracts, and the interpretation and enforcement of such contracts is beyond STB jurisdiction. Partly because it depends on facts: what steps would BNSF take to enforce the operating rule against UP? That is unknown. (*See* BNSF Reply Ev. at 34.)

But the AECC allegation that BNSF would stop its trains was an important issue, and Union Pacific answered as best it could. Union Pacific did point out practical considerations, that in its view, would prevent BNSF from trying to stop noncompliant trains owned by Union Pacific's customers on the Joint Line as AECC feared. The location of the TSM at MP 90 is so far south of the mines and so close to the end of the Joint Line at MP 117, that by the time BNSF could determine whether the train exceeded the emission standard, the train would be either already on Union Pacific's lines or so close to the end of the Joint Line that BNSF would not stop it. Furthermore, stopping the train on the Joint Line would be counterproductive: a stopped train is very disruptive on this very busy line and stopping the train between MP 90 and MP 117 would not allow Union Pacific, or the shipper, to take steps to bring the train into compliance. (UP Op. Ev. at 16, 19.) No party has disputed Union Pacific's analysis on this point.

Union Pacific went a step further and assured the Board and AECC and its other customers that *if* BNSF were to attempt to stop Union Pacific trains that were not in compliance, it would take immediate steps to get STB to intervene. (UP Op. Ev. at 19-20.) But we believe it is premature and speculative to predict what we would do in response to any other enforcement mechanism that BNSF may adopt for its operating rule sometime in the future other than to say that if we believe the BNSF application is unreasonable or discriminatory, we will seek appropriate remedies.

In the meantime, because we believe that the BNSF profiling and coal dust standards are reasonable and promote safe, efficient and reliable transportation, we have encouraged our customers to voluntarily comply. We are also developing the ability to provide real-time information on how their trains are loaded. (UP Op. Ev. at 21-22; UP

Op. Glass VS at 10-11.) We are not taking an inconsistent or self-serving position; we are recognizing the complications arising from a situation of many different stakeholders linked in a variety of different legal relationships where material facts are unknown and the STB's jurisdiction does not extend to all of the possible interactions.

C. Confidential Documents Produced by Union Pacific Under the Protective Order Entered in this Proceeding Should Not Be Made Public

Coal Shippers point out that Union Pacific and BNSF produced documents relating to the 2005 derailments designated as confidential or highly confidential, and ask the Board to make the documents public. (Coal Shippers Reply at 4, 6.). But Union Pacific, consistent with it rights do to so, merely produced confidential and highly confidential documents under the terms of the protective order entered in this proceeding. (STB Decision on Motion for Protective Order decided Nov. 30, 2009 & App.) Pursuant to that protective order, information designated confidential or highly confidential should "be kept under seal by the Board and not placed in the public docket or otherwise disclosed to the public." (*Id.* at 2.)

Coal Shippers offer no substantive reason for making these documents public. They fail to explain why any of the documents produced by Union Pacific concerning the May 2005 derailments are not entitled to a confidential or highly confidential designation. No party has previously challenged Union Pacific's designations or requested that any documents be de-designated. Likewise, these documents have consistently been treated as confidential and highly confidential business records throughout the course of this proceeding and in previous civil litigation without objection, and nothing would be gained from making them public. The Board invited all interested parties to participate in this proceeding. (*See* STB Decision decide Nov. 30, 2009 at 1-3.) Outside counsel and outside consultants for all parties of record have access to both confidential and highly confidential documents (based on our understanding that they have signed both undertakings), and parties' in-house representatives and employees may have access to confidential information pursuant to the terms of the Protective Order. (Nov. 30, 2009 Dec. at 3-4, App.)

Granting Coal Shippers' request would discourage voluntary compliance with discovery and lead to more disputes. Although Union Pacific was beyond the scope of the discovery in the Board's order instituting this proceeding, it voluntarily complied with discovery requests and relied in good faith on the Protective Order. As a result, other parties and the Board have benefitted from a more complete record. But if the Board were to grant Coal Shippers' request to "out" our confidential and highly confidential documents, Union Pacific and all other parties to future STB proceedings will limit their productions as much as possible since they will not be able to rely on protective orders to protect their confidential documents from disclosure. This will inevitably lead to more discovery disputes and more motions to compel. For these reasons, Coal Shippers' request should be denied.

CONCLUSION

In evaluating the reasonableness of BNSF's tariff rules, the Board must not chip away at a railroad's important statutory right to establish reasonable rules and practices related to its transportation and services. Nor should the Board act in a way to chill collaborative communications between Union Pacific and its customers concerning coal dust prevention. Accumulating coal dust on track presents a very real threat to continued safe and efficient rail transportation of all rail-transported products on all lines moving SPRB coal. In furtherance of its obligation to provide safe and efficient transportation, the Board should permit railroads to adopt reasonable rules and practices to prevent shippers' coal from escaping from railcars.

Dated: June 4, 2010

Respectfully submitted,

By: /s/ Joe Rebein
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IN THE CIRCUIT COURT OF PULASKI COUNTY, ARKANSAS

UNION PACIFIC RAILROAD COMPANY PLAINTIFF

v. No. CV2006-2711

ENTERGY ARKANSAS, INC.,
and ENTERGY SERVICES, INC. DEFENDANTS

ANSWER AND COUNTERCLAIM OF ENTERGY ARKANSAS, INC. AND ENTERGY SERVICES, INC.

Defendants Entergy Arkansas, Inc. ("EAI") and Entergy Services Inc. ("ESI") (EAI and ESI are collectively referred to herein as "Entergy"), by and through their undersigned counsel, hereby answer the Complaint and Application for Declaratory Judgment ("Complaint") of Plaintiff Union Pacific Railroad Company ("UP"), and counterclaim as follows:

I. ANSWER

1. Entergy admits the allegations contained in paragraph 1 of the Complaint.
2. Entergy admits the allegations contained in paragraph 2 of the Complaint.
3. Entergy admits the allegations contained in paragraph 3 of the Complaint.
4. Entergy admits the allegations contained in paragraph 4 of the Complaint.
5. Entergy admits the allegations contained in paragraph 5 of the Complaint.

Factual Background

6. Entergy admits on information and belief the allegations contained in paragraph 6 of the Complaint.

7. Entergy admits on information and belief the allegations contained in paragraph 7

of the Complaint.

8. Entergy admits on information and belief the allegations contained in paragraph 8 of the Complaint only to the extent that those allegations relate to the fact that UP and BNSF Railway Company share ownership of the Joint Line and that there is an agreement between UP and BNSF relating to the operation of that Joint Line. Notwithstanding the existence of the UP/BNSF Joint Line Agreement, Entergy denies that the UP/BNSF Joint Line Agreement in any way relieves UP of its duty in providing transportation service to Entergy to both provide and maintain track facilities that are necessary to transport Entergy's coal from the Powder River Basin ("PRB") mines in Wyoming to EAI's White Bluff and Independence coal-fired generating stations.

9. Entergy admits the allegations contained in paragraph 9 of the Complaint.

10. Entergy admits the allegations contained in paragraph 10 of the Complaint.

11. Entergy admits the allegations contained in the first sentence of paragraph 11 of the Complaint. Entergy denies the allegations contained in the second sentence of paragraph 11. Entergy admits the allegations contained in the third, fourth and fifth sentences of paragraph 11 as they relate to the limited quantities of coal actually delivered, but denies UP's allegation in the last sentence of this paragraph that it has "at all times complied with its obligations under the Contract."

12. Paragraph 12 of the Complaint refers to a contractual provision that speaks for itself and does not require a response.

13. Entergy denies the allegations contained in paragraph 13 of the Complaint, except to the extent that Entergy admits that there was precipitation on May 11, 2005, and that there

were derailments that occurred on the Joint Line on May 14 and May 15, 2005. Entergy denies that the precipitation was unprecedented, and that the storm caused either the derailments or the unstable track conditions as alleged by UP.

14. Entergy is without sufficient information to either admit or deny the allegations contained in the first three sentences of paragraph 14 of the Complaint. Entergy denies that UP's ability to perform under the Contract was materially impaired.

15. Entergy is without sufficient information to either admit or deny the allegations contained in paragraph 15 of the Complaint.

16. Entergy is without sufficient information to either admit or deny the allegations contained in paragraph 16 of the Complaint.

17. Entergy admits the allegations in the first and last sentences in paragraph 17 of the Complaint, and denies all other allegations in paragraph 17.

18. Entergy denies the allegations in paragraph 18 of the Complaint that UP "experienced several other Force Majeure events in 2005." Entergy admits that UP declared a Force Majeure on October 2, 2005, and that UP declared an end to the Force Majeure on October 28, 2005, but is without sufficient information to admit or deny all other allegations in paragraph 18.

19. Entergy is without sufficient information to either admit or deny the allegations contained in paragraph 19 of the Complaint.

20. Entergy admits the allegations that UP claimed Force Majeure from November 28, 2005 through December 12, 2005, and is without sufficient information to admit or deny the remaining allegations in paragraph 20.

21. Paragraph 21 misrepresents and contains an incomplete summary of contract provisions that speak for themselves and do not require a response.

22. Entergy admits the allegation in paragraph 22 of the Complaint that Entergy disputes UP's Force Majeure declarations. Entergy denies the allegations contained in paragraph 22 to the extent they suggest that UP has provided support for these declarations and to the extent they suggest that the Deficit Service Payment and transportation of additional make-up tons are the only remedy for UP's failure to deliver coal.

23. Paragraph 23 sets forth legal conclusions that do not require a response and contains an incomplete summary of contract provisions that speak for themselves and that do not require a response.

24. Entergy hereby realleges and incorporates by reference its answers to paragraphs 1-23 as though fully set forth herein.

25. Paragraph 25 of the Complaint sets forth a legal conclusion that does not require a response.

26. Paragraph 26 of the Complaint sets forth a legal conclusion that does not require a response.

27. Entergy hereby realleges and incorporates by reference its answers to paragraphs 1-26 as though fully set forth herein.

28. Entergy denies the allegations contained in paragraph 28 of the Complaint.

29. Entergy hereby realleges and incorporates by reference its answers to paragraphs 1-28 as though fully set forth herein.

30. Entergy denies the allegations contained in paragraph 30 of the Complaint.

AFFIRMATIVE DEFENSES

31. The Complaint fails to state a claim for which relief may be granted and should be dismissed pursuant to Rule 12 (b) (6) of the Arkansas Rules of Civil Procedure.

32. Entergy affirmatively asserts the defenses of waiver, estoppel and unclean hands.

JURY DEMAND

33. Entergy demands a trial by jury on all claims raised by UP's Complaint and the foregoing Counterclaim.

II.
COUNTERCLAIM

EAI and ESI hereby assert this Counterclaim against UP as follows:

Jurisdiction and Venue

34. Entergy realleges and incorporates by reference paragraphs 1 through 33 of its Answer to UP's Complaint.

35. This Court has subject matter jurisdiction over this action under Amendment 80 and A.C.A. 16-13-201. This Court has personal jurisdiction over this action pursuant to A. C.A. 16-4-101, based on UP's presence in and contacts with Arkansas. UP owns property and conducts business within the state of Arkansas. UP maintains significant contacts with the State of Arkansas that are sufficient to serve as a basis for the exercise of personal jurisdiction consistent with the laws of Arkansas and the Due Process Clause of the Constitution of the United States.

36. Venue is proper in Pulaski County under A.C.A. 16-55-213(a)(2)(B) and (a)(3)(B), as the county wherein both Entergy and UP maintain their principal offices in this state.

The Parties

37. UP is a Delaware corporation with its principal place of business located in Omaha, Nebraska.

38. EAI is a corporation organized and existing under the laws of the State of Arkansas, with its principal place of business located in Little Rock, Arkansas. EAI is a wholly owned subsidiary of Entergy Corporation, an investor-owned public utility holding company organized and existing under the laws of Delaware and registered pursuant to the Public Utility Holding Company Act of 1935. EAI produces, distributes and sells electric power at retail to approximately 667,000 residential, commercial, industrial and agricultural customers located in 63 counties in Arkansas, and engages in wholesale markets as well.

39. ESI is a wholly owned subsidiary of Entergy Corporation. ESI is a corporation organized and existing under the laws of the State of Delaware, and having its principal place of business in New Orleans, Louisiana. ESI acts as an agent for Entergy Corporation's public utility operating subsidiaries, including EAI, and is responsible for, among other things, acquiring fuel and related transportation for coal-fired power plants operated by its electric utility affiliates. In particular, ESI is responsible for procuring and arranging transportation of approximately 13 million tons of coal annually for transportation to, and use by, EAI at its coal-fired electric generating stations in Arkansas.

Historical Background

40. Entergy operates two coal-fired power plants designed to burn low-sulfur southern Powder River Basin ("PRB") coal. One of these plants is located near Redfield, Arkansas, in Jefferson County ("White Bluff Station") and one is located near Newark, Arkansas

("Independence Station").

41. The White Bluff and Independence Stations began operations in 1980 and 1983, respectively.

42. In generating electric power, EAI burns approximately 6.5 million tons of coal annually at White Bluff and approximately 6.5 million tons of coal annually at Independence, for a total of approximately 13 million tons of coal annually at both plants.

43. Except for limited amounts of coal barged to White Bluff on an emergency basis during UP's 1997-1998 and 2005-2006 service meltdowns, at all times since the commencement of operations, PRB coal burned at White Bluff and Independence Stations has been delivered by railroad.

44. Until recently, virtually all of the coal burned at White Bluff and Independence has been produced and supplied by mines located in the PRB.

45. All of the PRB coal delivered by UP to EAI originates in the southern PRB at mines located on a portion of rail track jointly owned by UP and BNSF that extends between Caballo Junction, Wyoming on the north end and Shawnee Junction on the south end. This line is commonly referred to as the "Joint Line."

46. In 1983, EAI's predecessor company, the Arkansas Power & Light Company, entered into two interrelated long-term coal transportation agreements with UP, Missouri Pacific Railroad ("MP") and Chicago and North Western Transportation Company ("CNW"), providing for the transportation of coal from various Powder River Basin ("PRB") mine origins to the White Bluff and Independence Stations. These agreements are collectively referred to herein as the "1983 Agreements."

47. Since 1983, UP has acquired and merged with both MP and CNW.

48. In 1991, Entergy and UP entered into an amendment of their 1983 Agreements. This amendment was reflected in the 1991 Interim Agreement.

49. The 1991 Interim Agreement, like the 1983 Agreements before it, included provisions requiring UP to deliver Entergy's coal pursuant to specified service standards. The service standard provision included a formula for calculating the number of "Deficit Tons" created as a direct result of the failure to meet the defined service standards, provisions allowing for the "make-up" of Deficit Tons within a defined time period, and liquidated damages provisions that applied under certain limited circumstances where make-up tons were not delivered.

50. The 1983 Agreements and 1991 Interim Amendment also included an express good-faith obligation to avoid creation of "Deficit Tons," a term defined in those agreements to include tons not delivered as a result of UP's failure to meet the defined service standards.

51. The 1983 Agreements and 1991 Interim Agreement also included a Minimum Annual Volume Commitment and required UP to transport the greater of the Minimum Annual Volume Commitment and 95% of Entergy's annual coal deliveries from PRB mines located in Campbell and Converse Counties, Wyoming. There was no maximum volume limitation in either the 1983 Agreements or the 1991 Interim Agreement.

52. In October 1997, Entergy sued UP in the United States District Court for the Middle District of Louisiana for failing to comply with its service obligations under the 1991 Interim Agreement. The case was subsequently transferred to the United States District Court for the District of Nebraska.

53. On January 28, 1999, United States District Judge Lyle Strom granted Entergy's Motion for Partial Summary Judgment and held that UP breached the 1991 Agreement by (1) failing to transport all coal tendered by Entergy, thereby creating deficits, and in (2) failing to make up deficit tonnage within the succeeding calendar quarter. *Entergy Services, Inc. v. Union Pacific Railroad*, 35 F.Supp.2d 746, 755 (D. Neb. 1999). Judge Strom also held, *inter alia*, that "the performance that Entergy bargained for was the delivery of coal;" that "UP must have understood that its primary performance obligation was to deliver the coal to Entergy;" and that the 1991 Interim Agreement was not an alternative performance agreement under which UP could choose to either perform (*i.e.*, deliver the required volumes) or pay liquidated damages. *Id.* at 752.

The 2000 Agreement

54. Entergy and UP ultimately negotiated a settlement of the 1997 service litigation. That settlement was memorialized in a series of agreements that includes the coal transportation agreement entered by and between Entergy and UP on August 29, 2000 (the "2000 Agreement") that is referenced in paragraph 9 of UP's Complaint. A copy of the 2000 Agreement is being separately filed under seal as Exhibit 1 to this answer and counterclaim.

55. The 2000 Agreement is a long-term coal transportation agreement that has significant value in the current transportation marketplace because UP has essentially ceased entering long-term coal transportation agreements in favor of a public pricing regime that is resulting in significantly increased coal transportation prices and reduced service commitments for PRB coal shippers.

56. The 2000 Agreement contains a Minimum Annual Volume Commitment that

requires Entergy to ship a minimum of 10 million tons of coal per year to White Bluff and Independence Stations from mines located in the States of Wyoming and Montana.

57. The 2000 Agreement does not contain any maximum annual volume commitment. Accordingly, UP is required to ship all of the tonnage that Entergy tenders from origins in Wyoming and Montana.

58. The 2000 Agreement contains a number of provisions that describe UP's commitments concerning the service to be provided in connection with the transportation of Entergy's PRB coal movements, including but not limited to: (a) the obligation to "transport all of Entergy's Annual Declared Tonnage, consistent with its service commitment described in Section 5.02;" (b) the obligation "to act in good faith to provide for the transportation of Tons under this Agreement, including, but not limited to, transportation of Tons in Railroad-supplied equipment during the Calendar Quarter for which the Tons are declared where necessary to avoid the creation of Deficit Tons as defined in Section 5.06;" (c) the obligation to transport Tons delivered in Entergy-supplied equipment within a specified average Elapsed Transit Time; and (d) the obligation to transport "Make-Up Tons," a defined term in the contract that only applies to Deficit Tons created by failing to meet the Elapsed Transit Time Average for Entergy-supplied trainsets within a specified make-up period.

59. Among the purposes of the service standards described in paragraph 49 above is to assure an adequate and continuous supply of coal to maintain electric generation at EAI's Arkansas plants and to optimize the productivity of Entergy's rail car fleet.

60. Pursuant to Article VI of the 2000 Agreement, Entergy is required to provide railcars in sufficient amount to enable UP to move the declared tonnages based on the

assumption that UP will meet its Elapsed Transit Time standards.

61. Article VI further requires that UP "shall provide all locomotive power and other equipment needed to fulfill its transportation obligations under the Agreement."

62. During the negotiation of the 2000 Agreement, UP never represented that it lacked the equipment, resources and facilities, including locomotives, crews and track, necessary to transport all of Entergy's coal requirements under the 2000 Agreement from the mine origins to the White Bluff and Independence Stations.

63. Entergy relied on the representations described in paragraphs 58 and 62 above in agreeing to settle its litigation and enter into the 2000 Agreement.

Entergy's Coal Supply Arrangements

64. Entergy has obtained PRB coal for use at White Bluff and Independence since they began operation in 1980 and 1983, respectively, pursuant to coal supply agreements ("CSA") with a variety of coal suppliers.

65. UP has participated in the transportation of PRB coal to White Bluff and Independence pursuant to the CSAs referenced in paragraph 64, herein.

66. Approximately 90 to 95 percent of the coal supplied to Independence is obtained pursuant to a long-term CSA with the North Antelope Coal Company which is owned by Powder River Coal, a subsidiary of Peabody Coal Company ("Peabody"). The remaining coal supplied to Independence is obtained from the spot market on an as-needed basis typically pursuant to short-term agreements having terms of a year or less.

67. Coal is supplied to White Bluff pursuant to contracts with various PRB coal

suppliers under four CSAs. Two-thirds of the White Bluff coal requirements are supplied under limited-term CSAs having terms of three years or less. The remaining coal need is satisfied with CSAs having a term of one year or less.

68. Entergy's CSAs with its coal suppliers provide them with volume and price commitments that are designed to assure Entergy with a reliable, cost-competitive source of PRB coal for its White Bluff and Independence Stations.

69. Entergy shares information with UP concerning its coal volume needs under its coal supply arrangements through a database maintained and overseen by the National Coal Transportation Association ("NCTA"). Pursuant to the NCTA process, Entergy and its coal suppliers each provide forecasts to UP of the amount of coal that Entergy needs under its CSAs in each month. This information is used by UP to understand the number of trainsets that Entergy will need and the number of loadings at the respective mine origins that will be necessary to deliver all of the coal that Entergy requires under its CSAs.

The Dispute

70. Pursuant to federal regulations, UP has a duty to maintain its track and related facilities in a manner that provides for adequate drainage of its track. *See e.g.*, 49 C.F.R. Parts 213.33 and 213.103. This duty includes the duty to maintain its roadbed and keep its roadbed free of obstructions that could impair the flow of water through the ballast.

71. Ballast is crushed rock or gravel placed on the roadbed to hold track ties in place and to promote uniform drainage.

72. When transporting coal by railroad it is common for coal dust to settle and accumulate in the roadbed.

73. Accumulation of coal dust in the roadbed, if not controlled, can "foul the ballast," thereby obstructing the flow of water through the ballast.

74. The obstruction of the flow of water through the ballast can cause the rail level to become uneven and the surface of the ballast to degrade.

75. When the roadbed does not properly support the track, the passage of coal trains can break ties which in turn causes the rail to spread apart thereby increasing the risk of derailments.

76. UP has been aware that coal dust has been accumulating in the PRB Joint Line roadbed for several years.

77. UP failed to take reasonable steps to assure that the integrity of its roadbed was not compromised as a result of the accumulation of coal dust in its roadbed.

78. UP's failure to take reasonable steps to maintain its roadbed to prevent the accumulation of coal dust and/or to take reasonable steps to remove coal dust from the roadbed resulted in track conditions that may have contributed to two derailments that were experienced on the Joint Line on May 14 and May 15, 2005.

79. UP's failure to take reasonable steps to maintain its roadbed to prevent the accumulation of coal dust and/or to take reasonable steps to remove coal dust from the roadbed may have resulted in track conditions that required it to engage in catch-up maintenance in 2005 that interfered with UP's obligation to deliver coal to Entergy under the 2000 Agreement.

80. UP's choice to defer maintenance on the Joint Line, and particularly as it related to the decision to delay addressing concerns regarding the accumulation of coal dust on the Joint Line roadbed, was an action that was within UP's reasonable control as one of the owners of the

Joint Line.

81. On May 18, 2005, UP notified Entergy of a Force Majeure condition that it alleged began on May 11, 2005, and stated the condition would continue until it could restore normal operations. UP claimed that the Force Majeure condition was the result of a snowstorm and two separate derailments that occurred on the Joint Line on May 14, 2005, and May 15, 2005.

82. BNSF also declared a Force Majeure relating to the same Joint Line derailments.

83. BNSF terminated its Force Majeure claim on June 3, 2005.

84. UP's Force Majeure claim remained in effect until November 23, 2005.

85. UP claimed that the extended duration of its Force Majeure claim was necessary to enable extensive maintenance on the Joint Line, including in particular the removal of extensive coal dust build-up.

COUNT I

(Breach of Contract)

86. Entergy hereby realleges and incorporates by reference paragraphs 1 - 85 of this Counterclaim.

87. UP has failed to deliver Entergy's coal requirements in accordance with the service, make-up, equipment and good faith obligations of the 2000 Agreement, as described above.

88. UP's failures to comply with its contractual obligations have resulted in substantial shortfalls in the delivery of coal to EAI's Arkansas plants.

89. In entering the 2000 Agreement, the performance Entergy bargained for was

delivery of coal. Entergy reasonably expected that UP would substantially perform its obligations to provide all necessary equipment and to deliver all of Entergy's PRB coal requirements.

90. UP's failure to comply with the contractual service, make-up, equipment and good faith obligations to deliver Entergy's coal needs has caused, and is continuing to cause, under-deliveries of coal that have created substantial hardship to Entergy.

91. UP failed to accept, or accepted but failed to operate for prolonged periods, trainsets tendered by Entergy that would have been sufficient to deliver Entergy's coal requirements under the 2000 Agreement.

92. By failing to accept, or accepting but failing to operate in accordance with contract terms for prolonged periods, Entergy-supplied trainsets, UP prevented Entergy from receiving coal that it was entitled to receive under the 2000 Agreement.

93. UP also failed to provide all necessary equipment, including locomotives, to facilitate the acceptance or continuous operation of Entergy-supplied trainsets necessary for the delivery of contract tons.

94. UP restricted the number of trainsets available to Entergy and the number of mine loading slots available to Entergy's coal suppliers.

95. UP limited the supply of PRB coal as a means to manage coal demand and its own restrained rail capacity in order to maximize the profitability of its coal movements.

96. UP refused to commit to provide rail transportation services that were necessary for Entergy to obtain coal deliveries from PRB coal suppliers pursuant to short-term and spot coal supply arrangements.

97. UP refused to make available rail transportation services that were necessary for Entergy to obtain coal deliveries from potential coal suppliers that could have mitigated the impacts of UP's poor service.

98. UP failed to make all reasonable efforts to continue to meet its contractual obligations to Entergy during its claimed Force Majeure Condition as required by Section 13.01 of the 2000 Agreement.

99. Entergy also reasonably relied on UP's commitment in the 2000 Agreement to exercise good faith to avoid creating deficit tonnages, and reasonably did not expect that UP would engage in a conscious and deliberate practice of rationing PRB coal amongst its various utility coal shippers without regard for its contractual commitments to Entergy and without regard to the fact that Entergy is one of UP's oldest and largest PRB coal customers.

100. By each of the above failures, UP has breached the 2000 Agreement thereby causing Entergy to incur tens of millions of dollars in damages.

101. All of the requirements of Article XXIII of the 2000 Agreement relating to Alternative Dispute Resolution have been satisfied fully by Entergy.

102. Entergy is entitled to recover attorney's fees pursuant to Ark. Code Ann. §16-22-308.

COUNT II

(Negligence)

103. Entergy realleges and incorporates by reference paragraphs 1 through 102 of this Counterclaim.

104. UP has a duty to maintain the track facilities used to provide service to Entergy,

including the track, ballast, and other supporting structures, pursuant to Federal regulations.

105. UP failed to assure that the ballast on the Joint Line was maintained in a manner that provided adequate drainage for the track.

106. UP's failure to maintain the Joint Line was a direct and proximate cause of the track failures experienced in 2005.

107. UP's failure to maintain the Joint Line was a direct and proximate cause of the extended disruption of the Joint Line that it asserts as the basis of its purported Force Majeure claim under the 2000 Agreement.

108. UP's failures to maintain the Joint Line were not reasonable under the circumstances.

109. UP should have foreseen that the deferral of maintenance on the Joint Line, and in particular the decision not to prevent and/or remove the accumulation of coal dust in the roadbed, could foul the ballast and impair the integrity of the roadbed making it more susceptible to track failures and other conditions that could increase the likelihood of derailments.

110. UP should have foreseen that protracted maintenance on the Joint Line would disrupt coal deliveries to its PRB coal shippers including Entergy.

111. UP's failure to maintain the Joint Line was, and continues to be, a direct and proximate cause of its inability to deliver coal to Entergy under the 2000 Agreement.

112. UP's failure to maintain the Joint Line was, and continues to be, a direct and proximate cause of Entergy's inability to enjoy the benefits of its CSAs.

113. UP had a duty to use reasonable care to properly maintain its roadbeds.

114. UP failed to use reasonable care in the maintenance of its roadbeds.

115. The failure of UP to use reasonable care in the maintenance of its roadbeds directly and proximately caused damages to Entergy. UP's failure to maintain the Joint Line was, and continues to be, a direct and proximate cause of substantial damages to Entergy under the 2000 Agreement. Such damages include, but are not limited to, costs incurred to obtain supplemental coal deliveries and/or alternate fuel sources; increased purchase power costs; lost energy sales; increased coal handling costs; and other costs and expenses associated with efforts to minimize the adverse impacts to Entergy's ratepayers of UP's non-delivery of coal under the 2000 Agreement.

116. UP knew or should have known that its conduct would naturally and probably result in injury or damage and continued the conduct with malice or with reckless disregard of the consequences from which malice can be inferred.

PRAYER FOR RELIEF

WHEREFORE, Entergy Arkansas, Inc. and Entergy Services, Inc. pray that the court enter judgment in their favor dismissing the complaint of the plaintiff with prejudice and awarding to Entergy Arkansas, Inc. and Entergy Services, Inc. damages in an amount to be determined but which substantially exceeds the minimum amount required for jurisdiction in the United States District Court based on diversity of citizenship and awarding attorney's fees, costs, prejudgment and post-judgment interest and all other proper relief.

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By: [signature]
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DATED: April 11, 2006

CERTIFICATE OF SERVICE

I hereby certify that on this 11th day of April, 2006, a copy of the foregoing was served, *via* hand delivery, upon the following:

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Steven W. Quattlebaum

Counsel Exhibit No. 9

IN THE CIRCUIT COURT OF PULASKI COUNTY, ARKANSAS
SIXTH DIVISION

UNION PACIFIC RAILROAD COMPANY PLAINTIFF

vs. CASE NO. CV2006-2711

ENTERGY ARKANSAS, INC. and ENTERGY SERVICES, INC. DEFENDANTS

and

ARKANSAS ELECTRIC COOPERATIVE CORPORATION, *et. al.* INTERVENORS

ORDER GRANTING IN PART AND DENYING IN PART UNION PACIFIC RAILROAD CO.'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON THE CLAIMS OF ENTERGY ARKANSAS, INC. AND ENTERGY SERVICES, INC.

On the 3rd day of March, 2008, came on for hearing *Union Pacific Railroad Co.'s Motion for Partial Summary Judgment on the Claims of Entergy Arkansas, Inc. And Entergy Services Inc.*, and from the pleadings filed herein, the argument of counsel, and all things and matters properly before the court, the court doth find as follows:

1. The request for summary judgment on the counterclaims of Entergy Arkansas, Inc. and Entergy Services, Inc. with respect to all damages other than liquidated damages is denied.

2. The request for summary judgment on the tort counterclaims of Entergy Arkansas, Inc. and Entergy Services, Inc. is granted. The court has determined that Wyoming substantive law is applicable to resolution of the tort counterclaims. The "economic loss" rule used in Wyoming would prevent the prosecution of the tort counterclaims in this matter and the tort counterclaims are accordingly dismissed with prejudice.

3. The request for summary judgment on the issue of "lost opportunity cost" damages is granted.

4. The request for summary judgment on the issue of damages for "other entities that are not party to the contract," is denied to the extent that such request may include the intervenors, Entergy Arkansas, Inc. or Entergy Services, Inc., but granted concerning all other entities.

IT IS ACCORDINGLY ORDERED AND ADJUDGED.

TIMOTHY DAVIS FOX
CIRCUIT JUDGE

3/4/08
DATE

**REBUTTAL VERIFIED STATEMENT
OF
DAVID CONNELL**

My name is David Connell. I am the Vice President of Engineering for Union Pacific and I sponsored a verified statement for Union Pacific's opening comments.

I have been asked to address the opinions of certain witnesses for the shippers regarding the cause and extent of coal dust accumulations on the Joint Line and Union Pacific's lines, describe the difficulty in detecting coal dust which has seeped into ballast, and respond to criticisms of railroad capacity and maintenance planning.

Coal Dust on Union Pacific Lines

The reply testimony of Messrs. Nelson and DeBerg on behalf of AECC continues to focus on the causes of the 2005 derailments on the Joint Line and their criticism of BNSF design and maintenance. BNSF has already addressed many of these criticisms in its reply testimony and I will not cover the same territory. Instead, I note that Union Pacific produced in discovery and submitted as exhibits to my March 16 statement copies of the 2008 and 2010 Shannon & Wilson reports on ballast samples taken on Union Pacific lines that showed contamination with coal dust fines as far as 600 miles from the Joint Line. Yet there is no mention in the Nelson or DeBerg statements of those reports, even though information in those reports directly contradicts several of their claims.

For example, Mr. Nelson broadly claims that "essentially all" of the sites where coal dust accumulated were at switches and bridges. (Nelson Reply VS at 6). While it is certainly true that dust accumulations are found at such locations, they also occur at other locations. Indeed, for the Shannon & Wilson survey, samples were collected every five miles on our Powder River

Subdivision and every 20 miles on the South Morrill, Kearney, and Marysville subdivisions and portions of the Sidney, Columbus and Kansas subdivisions. In addition, we also asked them to take samples at switches and bridges. The charts in those reports establish troubling accumulations of coal dust at many locations that do not involve switches or bridges.

Mr. Nelson then accuses the railroads of failing to recognize the role of vibration in depositing coal dust. He also accuses us of poor maintenance, although he offers no data to support his allegation. (Id. at 7). Union Pacific has a robust track evaluation and preventive maintenance program to identify rough track, turnouts and bridge approaches.[1] From an evaluation perspective, our tracks are inspected by a track inspector a minimum of two times per week, looking for exceptions to maintenance standards. State of the art track evaluation cars run our coal corridors two to three times each year looking for track exceptions. Vehicle Track Interaction (VTI) equipped locomotives are continuously running across the system evaluating the track looking for rough track exceptions. These are autonomous systems that operate on a 24 hour/365 day basis and can evaluate track multiple times during a week on the coal corridor. Ultrasonic rail flaw inspection vehicles, which evaluate the rail for surface and internal defects, are operated on coal routes as frequently as every fifteen days. All of these track evaluation processes generate data about the condition and health of the railroad that is then input into the engineering systems and drives preventive maintenance requirements. From a preventive maintenance standpoint, rail grinding is a preventive maintenance tool that is performed on Union Pacific's coal route that smoothes the rail, shapes the rail profile and reduces rail defects.

Moreover, Mr. Nelson fails to recognize the chicken-or-egg paradox with respect to vibration and coal dust losses at switches. Namely, a major cause of switches and bridges

1 Part of the increased cost and burden of maintenance that coal dust causes is associated with increased switch or control point maintenance. (Connell Op. VS at 6).

becoming rough is coal dust falling out at those locations and fouling the ballast, which increases roughness, which in turn would lead to coal dust falling out of the top of the cars.[2]

Mr. Nelson apparently fails to recognize that vibration is an inherent part of the movement of trains, but that does not mean that vibration makes it impossible to keep coal dust in the cars. The NCTA studies in 2005 and 2006 demonstrated that the use of surfactant reduces dust emissions and that load profiling also helps. Union Pacific also believes that compaction offers a promising method to prevent coal dust losses during transport and that is why we are working with a vendor, a producer, some of our customers and BNSF to arrange a test of a compaction process.

Problems with Detecting Coal Dust

Both BNSF and Union Pacific have noted the difficulty in locating all of the specific locations where coal dust has accumulated to excessive levels so that they can focus undercutting where most needed. Without that ability, some track will be undercut before it is necessary and other track may be undercut only after manifesting the problems we were trying to avoid. Both situations are inconsistent with efficient operations and reliable service. Mr. Nelson and Mr. McDonald dismiss the resulting extra cost and inefficiency for different reasons.

Mr. Nelson claims that ground penetrating radar can be used to identify locations where coal dust has accumulated. (Nelson Reply VS at 8). Ground penetrating radar is a new technology that we have tested on the Kearney, South Morrill, Powder River and Moffat Tunnel subdivisions. It is not a fully accepted practice in the United States yet because the output

2 Mr. Nelson assumes that the roughness would cause the coal to fall out of the bottom; however, Rex Beck of Union Pacific's Mechanical Department described our processes for inspecting coal cars and pulling defective cars from service and our efforts to repair our own fleet of open hoppers. (Beck Reply VS at 6-8). Union Pacific has already taken precautions to minimize coal dust loss from the bottom of coal cars.

requires sophisticated interpretation. The calibration process is still underway. The issues that we have encountered with GPR include:

- correlating the ballast fouling index with the actual amount of fouling,
- simplifying the output so that our maintenance personnel can use it, and
- excessive processing time to get useful results.

Mr. McDonald acknowledges that coal dust can seep into the ballast where it cannot be seen, but believes that it should be sufficient for railroad maintenance officials to realize that if they see coal dust on the surface in some locations that more frequent undercutting is necessary. (McDonald Reply VS at 3, fn. 2). His opinion is unrealistic. It disregards the scope of the rail lines involved: 1,590 track miles on Union Pacific alone east of the Joint Line, plus 327 track miles on the Joint Line, and the track miles on the BNSF beyond the Joint Line that are at risk. Yet the best available undercutting technology with a 38-person gang can undercut between .75 and 1.5 miles per day (depending on whether the track is returned to operations at night) and can only be deployed during seven months of the year – from April to November. Consequently, multiple undercutting gangs would have to be deployed throughout the season each year.

His opinion also ignores the uneven distribution of coal dust which the Shannon & Wilson surveys confirmed.[3] To expect a railroad to conduct out-of-face undercutting over hundreds of miles each year with multiple gangs without the ability to target such expensive and disruptive maintenance activity accurately is unreasonable and inefficient. Moreover, it also imposes a service-disruption burden on Union Pacific's non-coal customers who also ship over these lines.

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3 The Shannon & Wilson surveys confirmed the presence of significant amounts of coal dust at numerous locations where there were no bridges or switches, contrary to Mr. Nelson's expectation. (Nelson Reply VS at 6).

Unjustified Criticism of Track Design and Capacity

Mr. DeBerg opines that BNSF and Union Pacific "woefully underestimated the growth of the coal traffic [and] woefully under-designed the entire track structure", which he attributes to insufficient experience in maintaining track with these volumes. (DeBerg Reply VS at 4). He declares that "you have to design in additional tracks to disperse the tonnage or additional tracks to perform maintenance." (Id. at 5). Similarly, Mr. McDonald theorizes that Union Pacific and BNSF "did not want to spend the money to keep up with the increasing demand by increasing capacity and maintenance." (McDonald Reply VS at 4). The facts say otherwise.

Dennis Duffy in his rebuttal statement describes how Union Pacific has committed over $1.1 billion of dollars in track capacity and spent billions more in track maintenance on our coal franchise since 1999. Charts in his statement also illustrate how much additional track Union Pacific has constructed since 1995 and since 2000. (Duffy Rebuttal VS at 3). Union Pacific and BNSF retained CANAC, an engineering firm that specialized in capacity analyses, several times to assist them in planning capacity expansion on the Joint Line. Union Pacific also retained CANAC for similar analyses for its own lines. In each case, we implemented the recommendations when or even earlier than suggested.

The reality is that we anticipated the growth and planned successfully for it. The facts speak for themselves. Union Pacific has moved more SPRB coal than the year before each year since 1985 -- our first full year serving the SPRB -- to 2008 with only one exception.[4] Between 1985 and 2008, we grew the annual volume of SPRB tons moved from 19 million to 205 million – nearly a ten-fold increase.

4 In 1992 we moved only 56 million tons when in 1991 we moved 57 million. But we clearly had the capacity to move more since in 1993, we handled 74 million tons, or 33% more. In 2009, we moved less than in 2008, but that was clearly attributable to severe recession and not a lack of capacity.

But Mr. McDonald's criticism is misguided even when directed at BNSF. He contrasts the Joint Line in 2005 to Union Pacific's double main track beyond Shawnee Junction and claims that since the Joint Line handled twice-as-much traffic, the Joint Line lacked sufficient capacity to perform maintenance. (McDonald Reply VS at 4). His conclusion rests on mistaken information. He claims the Joint Line was mostly double track at the beginning of 2005 "with a short section of triple track on Logan Hill". (Id). In reality, the Joint Line was almost half triple-track in January and more than half triple-track by June. At the beginning of 2005, the triple-track extended from just north of Nacco Junction, MP 58 to MP 103. In June 2005, the triple-track was completed to Shawnee Jct. at MP 117, the southern terminus of the Joint Line. That additional 14 miles meant that the southernmost 59 miles (MP 58 to MP 117) of the Joint Line were triple-track and the northernmost 43 miles were double-track (MP 58 to MP 15).

More importantly, the Joint Line was triple-track for all segments whose density was greater than Union Pacific's lines and double-track only for those segments whose density was lower. The combined density in 2005 for Union Pacific and BNSF was 399 million MGT on the triple track from Nacco Junction to Shawnee Junction. Union Pacific's density on its double track east of Shawnee Junction was 267 million MGT. Both segments averaged 133 MGT per track mile. North of Nacco Junction, however, the density dropped to no more than 249 MGT for an average of 124.5 MGT per mile on the Joint Line's double-track.

Besides constructing hundreds of miles of new track in our coal corridor to accommodate both growth and maintenance, we have designed the new track to facilitate maintenance and to reduce impact and associated vibration. We used a minimum of 20-foot track centers so that we can perform maintenance on one track while running trains on adjacent track. We also installed concrete ties and premium rail. Premium track components have been designed and integrated into the heavy haul coal corridor to minimize impacts from heavy wheel loads. On these routes, No. 20-24 turnouts with 39' curved switch points with moveable point frogs are used at universal crossovers. The heavy haul environment drove the need for improvements in turnouts and frog design. The heavy tonnage and wear drove the need for spring and moveable point frogs. These changes increased the life cycle of the frog. These frogs have seen a vast improvement over conventional, i.e., there is 50% less impact from wheel loadings on the track structure versus a rail-bound manganese frog.

In addition, we have grown train size from an average of 13,827 tons in 2000 to 15,486 tons in 2008. The increase in average train size meant that we moved a record 205 million tons of SPRB coal by averaging 36 trainloads per day. If the average train size had not increased since 2000, we would have required 41 trainloads per day to move the same volume. By moving more coal with 10 fewer trains each day (5 loads and 5 empties), we created additional track capacity for maintenance on both the Joint Line and our own lines.

Mr. McDonald and Mr. De Berg believe that if coal dust requires more maintenance, then the railroads should build even more track. (McDonald Reply VS at 4; De Berg Reply VS at 5). But building more track in order to perform more maintenance to remove coal dust is not the answer. In the first place, the additional track will also have to be inspected and maintained. Moreover, as Mr. McCulloch points out, the construction of double, triple and quadruple track also means that there is more track, ballast and switches to catch the coal dust which escapes from trains moving on adjacent tracks. (McCulloch Rebuttal VS at 9). Therefore more track will increase the amount of coal dust that has to be removed from ballast *and* coal shippers would have to pay for that additional track.

Finally, Mr. De Berg concludes that neither Union Pacific nor BNSF "had sufficient experience in maintaining the track with the volumes of coal being accumulated." (De Berg Reply VS at 4). He is right in one sense: since the Joint Line is unprecedented in both the volume of heavy-haul traffic that it originates and the rate at which the volume grew, no one had prior experience for the maintenance challenges of the Joint Line or our coal lines connected to the Joint Line. That, of course, applies to Messrs. DeBerg, Nelson and McDonald as well. None of them have had actual experience in maintaining track moving the number of heavy haul trains that BNSF and Union Pacific do. I submit that the BNSF and Union Pacific engineering personnel have nonetheless performed well in response to the challenge. The proof of the statement is in the dramatic growth we have achieved and the few track-related derailments. More importantly, we are still learning as we continue to move more heavy trains over extremely dense corridors in a region with extreme weather. An article I submitted for a peer-reviewed publication states:

> "UP has continued to upgrade its HH trackage segments. Over the last 16 years, gross ton-miles on the system have grown more than 90 percent. This unprecedented growth has lead to a significant learning curve between railroads, suppliers, and researchers to understand how to mitigate the effects of HAL on track components. As a result, track components have been strengthened and reinforced to operate in a HAL environment.
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> "Determining the types of ties, rail, and fasteners to use are critical considerations when upgrading or constructing track to handle heavy axle loads. The railroads and its suppliers continue to find opportunities for improvement to counter the degradation of track components from the frequency of heavy wheel loads. Many of those improvements have extended component life and reduced maintenance costs."[5]

This learning curve includes coal dust. We have learned a great deal about coal dust and the risk it presents in the wake of the 2005 impairment of the Joint Line. In line with Continuous

5 "Guidelines to Best Practices for Heavy Haul Railway Operations", International Heavy Haul Association, Section 5.3., June 2009.

Improvement principles that it is better to prevent a problem than to clean up after it, I conclude that safe, efficient and reliable transportation is best-served if coal dust remains in coal cars.

VERIFICATION

I, David Connell, Manager, Vice President of Engineering of Union Pacific Railroad Company, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on this 3 day of June, 2010.

David Connell

REBUTTAL VERIFIED STATEMENT
OF
DAVID CONNELL

My name is David Connell. I am the Vice President of Engineering for Union Pacific and I sponsored a verified statement for Union Pacific's opening comments.

I have been asked to address the opinions of certain witnesses for the shippers regarding the cause and extent of coal dust accumulations on the Joint Line and Union Pacific's lines, describe the difficulty in detecting coal dust which has seeped into ballast, and respond to criticisms of railroad capacity and maintenance planning.

Coal Dust on Union Pacific Lines

The reply testimony of Messrs. Nelson and DeBerg on behalf of AECC continues to focus on the causes of the 2005 derailments on the Joint Line and their criticism of BNSF design and maintenance. BNSF has already addressed many of these criticisms in its reply testimony and I will not cover the same territory. Instead, I note that Union Pacific produced in discovery and submitted as exhibits to my March 16 statement copies of the 2008 and 2010 Shannon & Wilson reports on ballast samples taken on Union Pacific lines that showed contamination with coal dust fines as far as 600 miles from the Joint Line. Yet there is no mention in the Nelson or DeBerg statements of those reports, even though information in those reports directly contradicts several of their claims.

For example, Mr. Nelson broadly claims that "essentially all" of the sites where coal dust accumulated were at switches and bridges. (Nelson Reply VS at 6). While it is certainly true that dust accumulations are found at such locations, they also occur at other locations. Indeed, for the Shannon & Wilson survey, samples were collected every five miles on our Powder River

Subdivision and every 20 miles on the South Morrill, Kearney, and Marysville subdivisions and portions of the Sidney, Columbus and Kansas subdivisions. In addition, we also asked them to take samples at switches and bridges. The charts in those reports establish troubling accumulations of coal dust at many locations that do not involve switches or bridges.

Mr. Nelson then accuses the railroads of failing to recognize the role of vibration in depositing coal dust. He also accuses us of poor maintenance, although he offers no data to support his allegation. (Id. at 7). Union Pacific has a robust track evaluation and preventive maintenance program to identify rough track, turnouts and bridge approaches.[1] From an evaluation perspective, our tracks are inspected by a track inspector a minimum of two times per week, looking for exceptions to maintenance standards. State of the art track evaluation cars run our coal corridors two to three times each year looking for track exceptions. Vehicle Track Interaction (VTI) equipped locomotives are continuously running across the system evaluating the track looking for rough track exceptions. These are autonomous systems that operate on a 24 hour/365 day basis and can evaluate track multiple times during a week on the coal corridor. Ultrasonic rail flaw inspection vehicles, which evaluate the rail for surface and internal defects, are operated on coal routes as frequently as every fifteen days. All of these track evaluation processes generate data about the condition and health of the railroad that is then input into the engineering systems and drives preventive maintenance requirements. From a preventive maintenance standpoint, rail grinding is a preventive maintenance tool that is performed on Union Pacific's coal route that smoothes the rail, shapes the rail profile and reduces rail defects.

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Problems with Detecting Coal Dust

Both BNSF and Union Pacific have noted the difficulty in locating all of the specific locations where coal dust has accumulated to excessive levels so that they can focus undercutting where most needed. Without that ability, some track will be undercut before it is necessary and other track may be undercut only after manifesting the problems we were trying to avoid. Both situations are inconsistent with efficient operations and reliable service. Mr. Nelson and Mr. McDonald dismiss the resulting extra cost and inefficiency for different reasons.

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His opinion also ignores the uneven distribution of coal dust which the Shannon & Wilson surveys confirmed.[3] To expect a railroad to conduct out-of-face undercutting over hundreds of miles each year with multiple gangs without the ability to target such expensive and disruptive maintenance activity accurately is unreasonable and inefficient. Moreover, it also imposes a service-disruption burden on Union Pacific's non-coal customers who also ship over these lines.

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Unjustified Criticism of Track Design and Capacity

Mr. DeBerg opines that BNSF and Union Pacific "woefully underestimated the growth of the coal traffic [and] woefully under-designed the entire track structure", which he attributes to insufficient experience in maintaining track with these volumes. (DeBerg Reply VS at 4). He declares that "you have to design in additional tracks to disperse the tonnage or additional tracks to perform maintenance." (Id. at 5). Similarly, Mr. McDonald theorizes that Union Pacific and BNSF "did not want to spend the money to keep up with the increasing demand by increasing capacity and maintenance." (McDonald Reply VS at 4). The facts say otherwise.

Dennis Duffy in his rebuttal statement describes how Union Pacific has committed over $1.1 billion of dollars in track capacity and spent billions more in track maintenance on our coal franchise since 1999. Charts in his statement also illustrate how much additional track Union Pacific has constructed since 1995 and since 2000. (Duffy Rebuttal VS at 3). Union Pacific and BNSF retained CANAC, an engineering firm that specialized in capacity analyses, several times to assist them in planning capacity expansion on the Joint Line. Union Pacific also retained CANAC for similar analyses for its own lines. In each case, we implemented the recommendations when or even earlier than suggested.

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More importantly, the Joint Line was triple-track for all segments whose density was greater than Union Pacific's lines and double-track only for those segments whose density was lower. The combined density in 2005 for Union Pacific and BNSF was 399 million MGT on the triple track from Nacco Junction to Shawnee Junction. Union Pacific's density on its double track east of Shawnee Junction was 267 million MGT. Both segments averaged 133 MGT per track mile. North of Nacco Junction, however, the density dropped to no more than 249 MGT for an average of 124.5 MGT per mile on the Joint Line's double-track.

Besides constructing hundreds of miles of new track in our coal corridor to accommodate both growth and maintenance, we have designed the new track to facilitate maintenance and to reduce impact and associated vibration. We used a minimum of 20-foot track centers so that we can perform maintenance on one track while running trains on adjacent track. We also installed concrete ties and premium rail. Premium track components have been designed and integrated into the heavy haul coal corridor to minimize impacts from heavy wheel loads. On these routes, No. 20-24 turnouts with 39' curved switch points with moveable point frogs are used at universal crossovers. The heavy haul environment drove the need for improvements in turnouts and frog design. The heavy tonnage and wear drove the need for spring and moveable point frogs. These changes increased the life cycle of the frog. These frogs have seen a vast improvement over conventional, i.e., there is 50% less impact from wheel loadings on the track structure versus a rail-bound manganese frog.

In addition, we have grown train size from an average of 13,827 tons in 2000 to 15,486 tons in 2008. The increase in average train size meant that we moved a record 205 million tons of SPRB coal by averaging 36 trainloads per day. If the average train size had not increased since 2000, we would have required 41 trainloads per day to move the same volume. By moving more coal with 10 fewer trains each day (5 loads and 5 empties), we created additional track capacity for maintenance on both the Joint Line and our own lines.

Mr. McDonald and Mr. De Berg believe that if coal dust requires more maintenance, then the railroads should build even more track. (McDonald Reply VS at 4; De Berg Reply VS at 5). But building more track in order to perform more maintenance to remove coal dust is not the answer. In the first place, the additional track will also have to be inspected and maintained. Moreover, as Mr. McCulloch points out, the construction of double, triple and quadruple track also means that there is more track, ballast and switches to catch the coal dust which escapes from trains moving on adjacent tracks. (McCulloch Rebuttal VS at 9). Therefore more track will increase the amount of coal dust that has to be removed from ballast *and* coal shippers would have to pay for that additional track.

Finally, Mr. De Berg concludes that neither Union Pacific nor BNSF "had sufficient experience in maintaining the track with the volumes of coal being accumulated." (De Berg Reply VS at 4). He is right in one sense: since the Joint Line is unprecedented in both the volume of heavy-haul traffic that it originates and the rate at which the volume grew, no one had prior experience for the maintenance challenges of the Joint Line or our coal lines connected to the Joint Line. That, of course, applies to Messrs. DeBerg, Nelson and McDonald as well. None of them have had actual experience in maintaining track moving the number of heavy haul trains that BNSF and Union Pacific do. I submit that the BNSF and Union Pacific engineering personnel have nonetheless performed well in response to the challenge. The proof of the statement is in the dramatic growth we have achieved and the few track-related derailments. More importantly, we are still learning as we continue to move more heavy trains over extremely dense corridors in a region with extreme weather. An article I submitted for a peer-reviewed publication states:

> "UP has continued to upgrade its HH trackage segments. Over the last 16 years, gross ton-miles on the system have grown more than 90 percent. This unprecedented growth has lead to a significant learning curve between railroads, suppliers, and researchers to understand how to mitigate the effects of HAL on track components. As a result, track components have been strengthened and reinforced to operate in a HAL environment.
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This learning curve includes coal dust. We have learned a great deal about coal dust and the risk it presents in the wake of the 2005 impairment of the Joint Line. In line with Continuous

5 "Guidelines to Best Practices for Heavy Haul Railway Operations", International Heavy Haul Association, Section 5.3., June 2009.

Improvement principles that it is better to prevent a problem than to clean up after it, I conclude that safe, efficient and reliable transportation is best-served if coal dust remains in coal cars.

VERIFICATION

I, David Connell, Manager, Vice President of Engineering of Union Pacific Railroad Company, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on this 3 day of June, 2010.

David Connell

REBUTTAL VERIFIED STATEMENT
OF
MARK J. DRAPER

My name is Mark J. Draper. I am Manager - Economic Research in Union Pacific's Finance Department. My primary responsibilities include preparing regulatory costing analyses, which consist of performing reparations and updating costs to comply with STB rate prescription orders. I also have responsibilities associated with contract rate adjustments, RCAF-related analyses, and redeployment activities.

I have been asked to review and to comment on the conclusions and analyses in the Reply Verified Statement of Thomas D. Crowley, submitted on behalf of Coal Shippers. Mr. Crowley has misstated Union Pacific's revenue and variable costs associated with SPRB coal and overstated the contribution available to support the coal network that our SPRB customers rely on. Consequently, his conclusion that Union Pacific earns enough on its coal traffic to absorb additional and avoidable costs to remove coal dust is wrong.

<u>SPRB Coal Revenue Overstated</u>

To begin with, the BNSF tariff rules at issue in this proceeding would apply only to Union Pacific's SPRB coal movements, to the extent they applied to Union Pacific at all. Yet Mr. Crowley's cost analysis includes Union Pacific's total coal revenue and contribution. Besides overstating the total contribution available to pay for increased maintenance requirements associated with coal dust, his analysis relies on assumptions and data that are not representative of SPRB coal moving on Union Pacific lines and that are internally inconsistent.

His workpapers indicate that he relies on both Union Pacific's Quarterly Commodity statistics ("QCS") and the UP Fact Book.[1] Mr. Crowley relied on the QCS for the number of tons and amount of revenue associated with coal. He used the total. This overstates both volume and revenue since SPRB coal accounts for no more than 74% of Union Pacific total coal carloads in any of the years 2005 through 2008. The remainder of the coal is originated by Union Pacific in Colorado and Utah (approximately 16%), with the balance coming from Illinois and southern Wyoming coal originations, New Mexico or Appalachian coal received in interchange from other rail carriers, and coke, which is originated and received in a variety of locations. (2008 UP Fact Book, Exh. MJD-1 at 20). The QCS does not include revenue-ton miles, so Mr. Crowley turned to the UP Fact Books for that data, but by doing so introduced a mismatch. While the QCS data could be selected by the STCC 11, the commodity code for coal, the UP Fact Book description of the Energy Business Group includes data for all commodities that Energy Marketing handles, which includes coke, with the STCC 29914.[2]

Variable Costs for Coal Understated

Mr. Crowley chose to compound these data errors by making an unjustified adjustment to reduce Union Pacific's variable costs for coal by 17%. He derived his adjustment from a comparison of the final decision in the WPL rate case of the variable costs for traffic moving in

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1 Union Pacific Corporation publishes its "Analyst Fact Book" each year. I follow Mr. Crowley's practice of simply referring to it as the UP Fact Book.

2 See Mr. Crowley's workpapers to his Reply VS, attached on a CD to Coal Shippers' Reply Ev.

2000 to a system average Uniform Railroad Costing System (URCS) calculation for 2000.[3] Mr. Crowley makes no attempt to demonstrate the validity of the adjustment for all Union Pacific coal (and coke) traffic moving during the years 2005 through 2008, inclusive, even though he relies on it to overstate Union Pacific's contribution on coal by 86%. The WPL adjustment is unwarranted and misleading for numerous reasons.

First, much of the difference between the ***WPL Decision*** and unadjusted URCS is attributable to the Board's acceptance of the Speed-Factored Gross Ton ("SFGT") adjustment to maintenance-of-way costs. (***WPL Decision***, slip op. at 5). Since then, the STB has rejected SFGT as a reliable methodology and relies now on URCS.[4]

Second, Mr. Crowley has not shown that the 2000 WPL movement to Sheboygan, Wisconsin, was representative of SPRB traffic then, or that the characteristics of that 2000 movement are typical of the coal moves in 2005 through 2008. Simple fact-checking would have raised warning flags against relying on the WPL move as representative. For example, the WPL trains in 2000 came from only two mines, Black Thunder and Antelope, which are among the most southerly of the mines on the Joint Line. Today there are five mines more distant

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3 ***Wisconsin Power & Light Company v. Union Pacific Railroad Company***, Docket No. 42051, (decision served May 14, 2002). (***"WPL Decision"***). See Crowley Reply VS at 6, fn 8.

4 ***Texas Municipal Power Authority v. The BNSF Railway***, 6 STB 573, 633 (2003) ("...the rail industry has changed significantly since the SFGT was developed, in the manner of accounting for MOW expenses, in maintenance practices in traffic densities, and in the types of track materials used. But SFGT has not been re-benchmarked to take into account these changes. ... Accordingly, we are persuaded that the passage of time has rendered the SFGT formulas unreliable. "affirmed on reconsideration, 7 STB 803, 810-812 (2004). ("...there is no evidence that the SFGT formula produces MOW expenses that are comparable to current actual MOW costs for any rail line.")

than these mines that originate coal on Union Pacific (Caballo, Belle Ayr, Caballo Rojo, Cordero and Coal Creek).

Even so, the WPL trains moved much longer distances than Mr. Crowley assumes for his development of variable costs. The Black Thunder loaded trains moved 1,270.24 miles and the Antelope loaded trains moved 1,244.93 miles, but the longest move in Mr. Crowley's calculations is the 1,026 miles he relies on for all Union Pacific and BNSF trains in 2008.[5] A WPL Black Thunder train moved 23.8% more miles, which would have a telescoping effect on the overall variable costs. Since it costs more per mile to stop and load and unload a unit coal train than to keep it running once launched, the variable costs for long-haul trains tends to be lower per ton-mile than for shorter haul trains. That calls into question relying on the percentage difference between a movement-specific cost determination and URCS system average for long haul movements and applying it to significantly shorter moves.

The WPL trains were also smaller than the average SPRB train originating on Union Pacific in 2000. They ranged from 12,653 net tons to 12,846 net tons as compared to the average lading weight of 13,827 in 2000.[6] Moreover, they used only two locomotives for most of the route, whereas most SPRB coal goes south at Gibbon and those trains generally use three locomotives because the grades are more challenging and the trains are longer than those going east, like WPL. Accordingly, the reduction in variable costs for Union Pacific movements is unjustified and unreliable.

5 Compare Table A-2 in ***Wisconsin Power & Light v Union Pacific Railroad***, 5 STB 955, 990 (2001) to Crowley workpapers.

6 Sources: Table A-2 lading weight tons per car x cars per train. ***Id.***

Removal of Mr. Crowley's ***WPL Decision*** adjustment results in quite a different picture than he portrays. Mr. Crowley estimated cumulative contribution from Union Pacific coal of $3.74 billion dollars. When unadjusted variable costs are used, the cumulative contribution is only $2.01 billion, or 46% less. Of course, this still overstates the amount of contribution from SPRB traffic since it includes all coal and coke moved by Union Pacific. Table 1 below restates Mr. Crowley's Table 1:

Table 1
Comparison of Union Pacific Revenues and Contribution for Coal 2005 to 2008
Aggregate Amount for Coal (millions)
(differences due to rounding)

Year	Revenues	Variable Costs	Contribution	Revenue-to Variable Cost
(1)	(2)	(3)	(4)	(5)
2005	2,555	2,242	314	1.14
2006	2,955	2,389	566	1.24
2007	3,115	2,585	529	1.20
2008	3,767	3,163	604	1.19

Union Pacific Coal Contribution Does Not Cover All Costs

Mr. Crowley claims that all of this contribution is available to cover increased maintenance required by coal dust or to add capacity to offset the service disruptions that would be caused by an accelerated undercutting cycle of three-to-six years plus increased cleaning and replacement of switches. Specifically, Mr. Crowley states that "[t]he contribution in [his Table 1] is calculated *after* the railroads have covered the costs to perform the maintenance activities and paid for the incremental road property investment required for the high volume of coal...". (emphasis added).[7] As an experienced railroad cost analyst, Mr. Crowley knows, or should know, that URCS assigns half of road investment capitalized roadway maintenance to fixed costs and excludes it from variable costs. The 50% variability assigned to road property return (which includes capitalized maintenance as well as the original installation) makes his statement literally untrue.[8]

Mr. Crowley's claim that contribution is calculated after the costs for maintenance and property investment is wrong because it equates contribution with profit. URCS variable costs are only a portion of a railroad's total costs. The rates our customers pay must cover both variable costs and fixed costs. The difference between revenue and variable costs is referred to as contribution, not profit, because it is available to contribute to fixed costs.

Railroad fixed costs account for a significant share of our total costs. The 2008 URCS application for Union Pacific calculated total costs for Union Pacific as $17.5 billion and fixed costs as $4.2 billion. That means that Union Pacific would have to receive revenue equal to 132% of its variable costs to recover its total costs in 2008, but the revenue-to-variable cost

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7 Crowley Reply VS at 6.

8 ***Adoption of Uniform Railroad Costing System***, 5 ICC 2d 894, 919, fn 78 (1989). The 50% variability for road property return is only one of several reasons why Mr. Crowley's claim that his calculation of the increase in URCS variable costs between 2005 and 2008 for coal includes all of the "extraordinary costs" incurred to maintain our coal lines is incorrect. (*See* Crowley Reply VS at 7). Besides assigning half of roadway investment cost to fixed costs, URCS uses a five-year normalization period for MOW so that in 2005 only 20% of the cost reflected increased spending for coal dust removal, 2006 had 40%, etc. In addition, those "extraordinary costs" associated with coal were distributed by URCS to all traffic instead of being assigned only to coal.

ratio for coal in 2008 was only 119%.[9] Given how heavy-haul coal trains impose higher maintenance costs and the more than $1.1 billion in track capacity expenditures Union Pacific has invested in our coal network since 1999, coal needs to achieve an even higher contribution to be reinvestable.

Mr. Crowley should be on notice of Union Pacific's consistent failure to recover its full investment costs. Each year the STB determines the revenue adequacy of each Class I Railroad by comparing its Return on Investment to the railroad cost-of-capital. Union Pacific's cumulative shortfall for the years 2005 through 2008 inclusive is $2.6 billion.

9 I make this point only to demonstrate that Mr. Crowley's claim that coal revenue has covered all of the cost of track maintenance and road investment is inaccurate. I am not endorsing an average total cost test. Due to the difference in demand among our customers and the need to recover significant fixed costs, the Board has long recognized that railroads must engage in differential pricing if they are to have any chance of earning returns sufficient to sustain the rail network. Accordingly, customers who require rail service the most should pay above-average margins.

UP Revenue Adequacy Results - 2005 through 2008

(Dollar amounts in thousands)

		2005 a/	2006 a/	2007 a/	2008 a/
	Net Investment Base				
1	January 1	$21,516,704	$22,623,401	$23,399,780	$24,198,745
2	December 31	$22,623,401	$23,399,780	$24,198,745	$25,433,892
3	Average	$22,070,053	$23,011,591	$23,799,263	$24,816,319
4	Actual Net Railway Operating Income	$1,398,344	$1,889,540	$2,118,351	$2,594,858
5	Actual Return on Net Investment Base	6.34%	8.21%	8.90%	10.46%
6	Annual Cost of Capital	12.2%	9.94%	11.33%	11.75%
7	Target Net Railway Operating Income	$2,692,546	$2,287,352	$2,696,456	$2,915,917
8	Shortfall	**($1,294,202)**	**($397,812)**	**($578,105)**	**($321,059)**
9	Cumulative Shortfall	**($1,294,202)**	**($1,692,015)**	**($2,270,120)**	**($2,591,179)**

a/ Schedule 250 data as filed by UPRR.

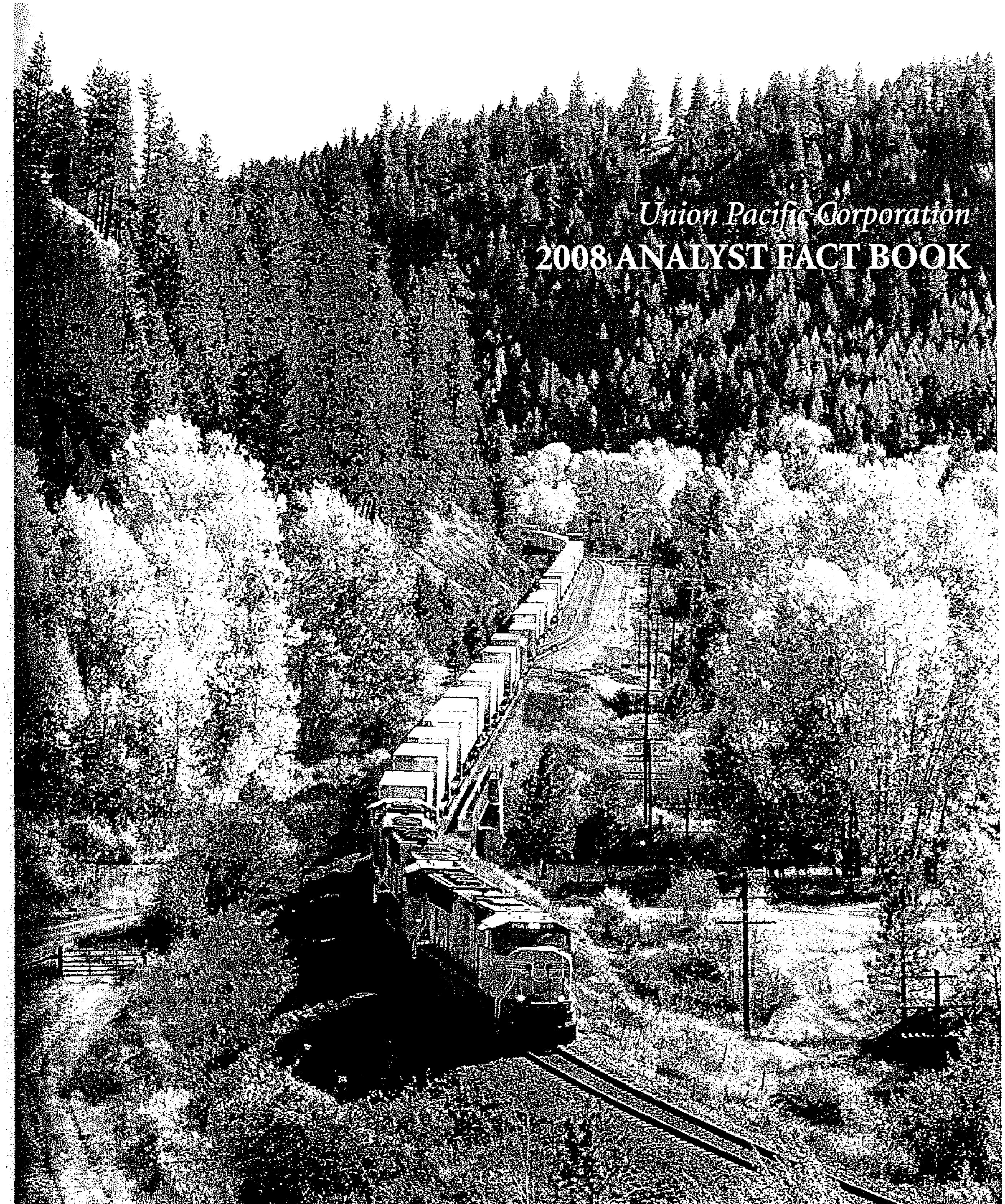
VERIFICATION

I, Mark J. Draper, Manager, Economic Research & Analysis of Union Pacific Railroad Company, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on this 3rd day of June, 2010.

Mark J. Draper

Exhibit MJD-1



BUILDING AMERICA

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Company Vision/Mission Statement

VISION
Building America
Our vision symbolizes the Union Pacific experience for all the people whose lives we touch. It connects the importance of UP's rail transportation to America's economy, honors the generations that preceded us and is the promise for the generations that will follow us.

MISSION
The Men and Women of Union Pacific Are Dedicated to Serve.
Union Pacific works for the good of our customers, our shareholders and one another. Our commitment defines us and drives the economic strength of our company and our country.

VALUES
Focus on Performance.
Our concentration and determination will drive our safety, customer satisfaction and quality results.

Ensure High Ethical Standards.
Our reputation will always be a source of pride for our employees and a bond with our customers, shareholders and community partners.

Work as a Team.
We are all part of the same team, and working together to reach our common goals is one of our strengths. Communication and respect are the foundation of great teamwork.

Company Overview

Union Pacific Corporation (NYSE:UNP) is one of America's leading transportation companies. Its principal operating company, Union Pacific Railroad, is the largest railroad in North America, covering 23 states across two-thirds of the United States.

Investor Inquiries

Union Pacific's investor relations are coordinated through the Corporate Treasurer. Requests for interviews, investor packages and general information should be directed to:
(402) 544-4227 or (877) 547-7261 or investor.relations@up.com

Web Site Information

For immediate receipt of new information as it becomes available, we invite you to regularly visit www.up.com. In the Investors section, you can view on-line or download a variety of informative documents, including SEC filings, annual reports, proxy statements, quarterly earnings, press releases, company presentations and corporate governance information. For automatic updates, please subscribe to the Company's RSS (Really Simple Syndication) feed which provides links to new headlines and summaries through your news reader.

Overview

Operations & Productivity

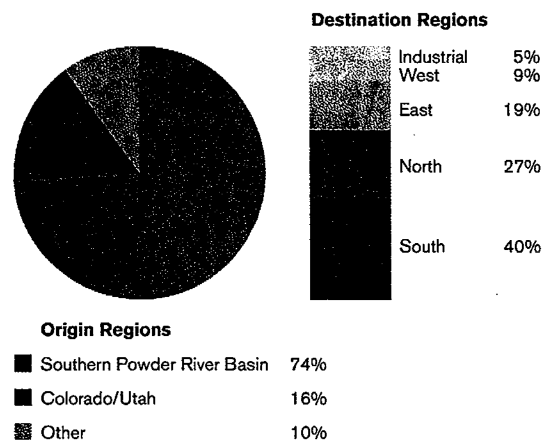
Markets

Financials

Energy

Commodity Profile

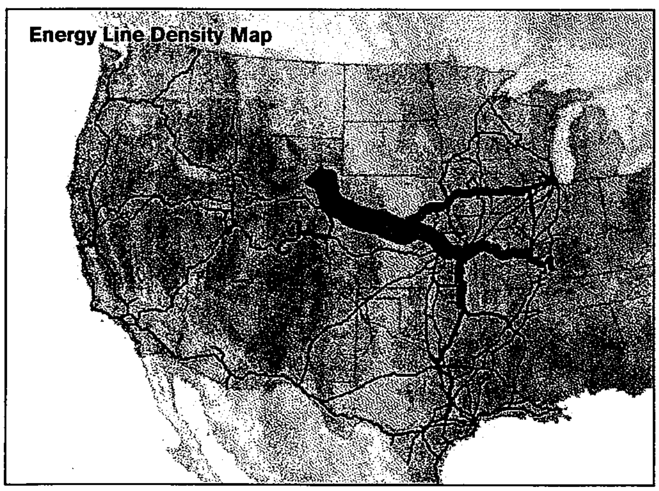
2008 Carloads



Coal and petroleum coke transportation accounted for 22 percent of Union Pacific's freight revenue in 2008, the largest share of revenue among UP's six business teams. The Railroad's franchise supports the transportation of coal and coke to utilities, industrial facilities, interchange points and water terminals. The water terminals support shipments to eastern utilities located on the Mississippi and Ohio Rivers and the Great Lakes. Union Pacific also utilizes the same river network to support export coal to Europe, along with the West Coast ports to support export coal to Asia.

SPRB coal is the largest segment in UP's energy business. In 2008, SPRB carloadings totaled 74 percent of UP-originated coal volumes. The Railroad also moves high-BTU (British Thermal Units), low sulfur bituminous coal from Colorado and Utah to domestic utilities and industries. For 2008, Colorado/Utah coal traffic represented 16 percent of total coal volumes. The remaining coal loadings originated in southern Wyoming's Hanna Basin and southern Illinois, and also included SPRB coal forwarded to UP from another carrier.

Demand for coal held up throughout 2008, as domestic strength and continued conversion to western coal was supplemented by increased international demand for western U.S. bituminous coal. Overall, coal carloadings were up 2 percent year-over-year. The year began with a robust 6 percent first quarter volume increase fueled by strong demand and supply chain performance. Despite heavy rain and SPRB mine flooding in May and widespread Midwestern flooding in June, second quarter volume grew 2 percent. Although lingering effects of the Midwest flooding continued into the third quarter, volume still rose 3 percent over the prior year. Fourth quarter volume slipped 1 percent due primarily to Colorado/Utah production problems.



Lane density based on carloadings. Line thickness depicts traffic density.

With an emphasis on productivity initiatives, SPRB average train size increased more than 1 percent to a record 15,488 tons per train during 2008. An increase in average tons per car, as well as a one-car increase in train length, drove the improvement. The train length improvement was aided by track expansions at select utilities to accommodate longer trains and improved North Platte terminal operations in consistently fulfilling train length targets.

UP set numerous volume records out of the SPRB in 2008. Most notably, an all-time train loading record was set in August with 1,190 trains. Between July and December, more than 1,100 coal trains were loaded each month. In addition to the train size increase, SPRB annual records were established for trains (13,212), tons (204.6 million) and carloads (1.73 million).

Colorado/Utah volume dipped 4 percent from 2007 levels due largely to mine production and coal quality issues. These issues included numerous longwall moves, high methane gas levels, significant geological shifts, poor coal quality caused by excessive rock intrusions, and production delays caused by regulatory safety concerns. However, in spite of these challenges, UP still

REBUTTAL VERIFIED STATEMENT OF DENNIS J. DUFFY

Introduction

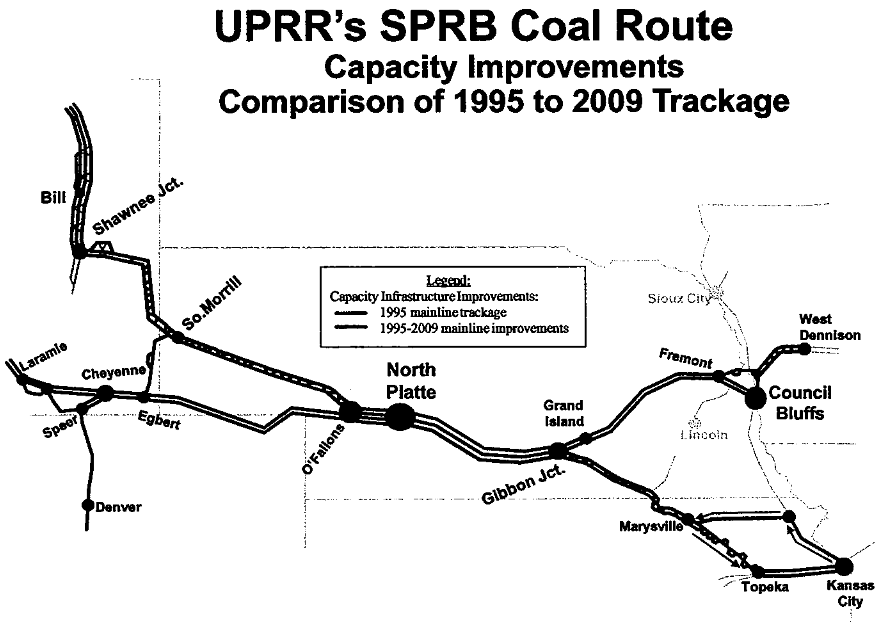
My name is Dennis J. Duffy and I am Vice Chairman - Operations for Union Pacific Railroad Company ("Union Pacific"). I started my career with Union Pacific in 1973 and have held a variety of positions in Operations, Finance, and Marketing and Sales since then. From September 1998 through December 2009, I was Executive Vice President - Operations, during which time I was responsible for overseeing all operating, engineering and maintenance for Union Pacific. In January 2010, I became Vice Chairman – Operations, and I continue to have those same responsibilities in my present position, with the addition of other, new responsibilities as well.

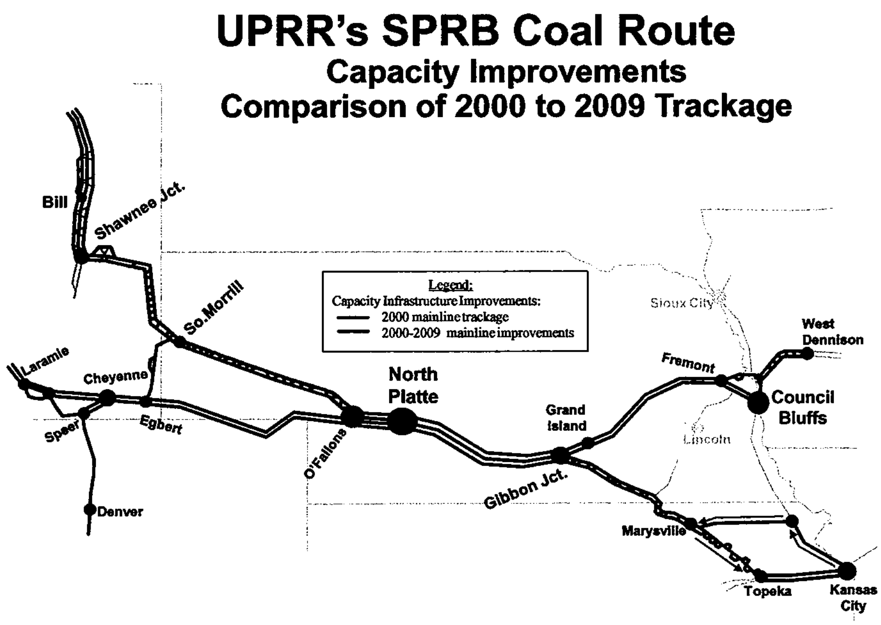
I received a degree in accounting from the University of Nebraska at Omaha, and attended graduate school at the UNO. I also completed Harvard's Program for Management Development.

I am submitting my rebuttal statement for four purposes. First, I want to review Union Pacific's commitment to coal. Second, I want to emphasize how seriously we, as a company, view the threat posed by coal dust when it gets into the railroad ballast. Third, I want to explain the Union Pacific philosophy of being proactive in all aspects of our operations, from inspections and preventive maintenance to capacity planning and construction of new track, as the best way to eliminate the risk of **potential** problems before they become **actual** problems. We emphasize prevention activities because they are much more effective and much less disruptive than trying to fix problems after the failure has occurred. This foundational principle of Continuous Improvement, employed widely in industry, has been critical to growing with our coal customers to move unprecedented levels of tonnage while also improving cycle times. Our interest in seeing coal shippers take steps to contain their lading within their railcars is consistent with our overall approach as a company both for our own actions and shipper activities that affect transportation on Union Pacific lines. And finally, I want to respond to comments made in the reply arguments submitted by Coal Shippers regarding a handful of Union Pacific documents written immediately after the two derailments that occurred on the Joint Line in May 2005 that Coal Shippers claim suggest that Union Pacific concluded the derailments were caused by BNSF's failure to perform proper maintenance on the Joint Line track. This was not Union Pacific's conclusion, and I will explain the context of the referenced documents, and what Union Pacific ultimately concluded about the root cause of the 2005 Joint Line failure after thorough investigation.

Union Pacific's Commitment to the Coal Business

During my tenure as head of operations for Union Pacific, we have made an unprecedented commitment to the Energy business to develop our ability to grow with and to serve our customers. Our actions have covered the entire range of improvement alternatives, including substantial expenditures for capacity and equipment; development of new technology; improvement of our operating processes and procedures; and organizational development, training, and staffing additions. Between 1999 and 2009, the infrastructure capacity additions for the Energy business have totaled over $1.1 billion. For the same time period, the locomotive investment to support the Energy business has also totaled nearly $1.1 billion. These capital investments are in addition to the more than $5 billion in maintenance associated with coal during the same time period. As reflected on the following schematics, we have added double, triple, and quadruple track to the Joint Line as well as Union Pacific's main line stretching from Shawnee Junction to eastern Iowa and into northeastern Kansas.





These investments and accompanying process improvements enabled us to grow the SPRB coal operation to a record level of 205 million tons in 2008. They also enabled us to improve coal train velocity to 23.5 mph in 2008. Coal train velocity increased again in 2009 as Mr. Crowley states in his reply statement, but he neglects to mention that a 28 million ton decline to 177 million tons in SPRB volume also contributed to that last improvement in velocity. That recession-driven drop in coal demand has also deprived us of revenue we were counting on to pay for those investments.

Union Pacific Takes Very Seriously the Risks Posed by Coal Dust

During inspections on the Joint Line in 2003, we noticed areas where the ballast was fouled by coal dust, requiring more aggressive undercutting, switch replacement and switch cleaning. Union Pacific and BNSF jointly approved an increased budget for maintenance, and in late 2003 through 2004, BNSF, as the party contractually responsible for performing maintenance on the Joint Line, performed extensive track cleaning on the Joint Line. As a result, the number of slow orders diminished, and increased tonnages moved in late 2004 through the first quarter of 2005. In fact, we moved record volumes of coal in the first quarter of 2005, indicating a track that was healthy, stable and in good condition. Largely because so much cleaning and undercutting had been performed in 2003-2004, Union Pacific was very much taken by surprise by the two back-to-back derailments that occurred on the Joint Line in mid-May 2005, and even more shocked upon inspecting the track to see the extent of fouling from coal dust throughout the line.

It was that experience in 2005, and the subsequent studies of coal dust, that began Union Pacific's education about the uniquely destructive properties of coal dust. Since 2005, we have learned that coal dust is a pernicious ballast foulant, and that, because it can accumulate in the ballast without being visible or readily detectable by manual or technical inspection, it can quickly destabilize track under the right conditions (i.e., when combined with precipitation) with little or no notice.[1] Based on what we have learned about the qualities of coal dust and its ability to foul ballast and destabilize track, and given the quantities of coal dust that are released from the flow of coal traffic out of the SPRB, Union Pacific takes very seriously the threat posed by coal dust emissions, left unchecked, to the safe, reliable and efficient transport of coal and other customers' traffic across our lines.

Coal traffic commingles on Union Pacific's network with a wide array of other customers' traffic, representing the nation's commerce. Our coal lines include major rail corridors that serve the entire western United States. For example, our Central Corridor through North Platte carries more than 6,000 freight cars and intermodal shipments each day other than coal. We move these shipments for our intermodal, auto, agricultural, industrial products, and chemicals customers. We provide critical service to these customers by connecting West Coast points, the major eastern gateways, and numerous states in between.

Accordingly, we were very concerned when coal dust was found in significant amounts hundreds of miles from the SPRB mines and on Union Pacific lines carrying less coal traffic than the Joint Line. Shannon & Wilson, Inc., retained by Union Pacific to determine coal dust levels on its main lines, has confirmed the presence of coal dust hundreds of miles beyond the Joint Line. (*See* UP Op. Arg., Connell Op. VS at 16-18). They concluded that coal dust comprised as much as 20% of fine volume in ballast sampling performed on Union Pacific's main line coal corridor almost 600 miles beyond the Joint Line, even where new ballast was laid

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1 See UP Op. Ev., Connell VS at 9, 14; UP Reply Ev., McCulloch VS at 9; E. Tutumluer, *Laboratory Characterization of Fouled Railroad Ballast Behavior* at 8, 3/15/09, attached to UP's Op. Ev. at Ex. DC-1.

and new rail and concrete ties were installed fairly recently. (*Id.* at 16-17). As a result of the increased accumulation of coal dust, we anticipate that main line track will need to be undercut as often as every 3 to 6 years, instead of the historical 10 to 15-year cycle. (*Id.* at 17-18).

Union Pacific's Goal in All Aspects of its Operations Is to "Find the Problem Before it Finds You"

Union Pacific's top priority in running its railroad is safety – the safety of our employees, the public, and of the track itself. We emphasize safety first because it is the right thing to do, but prioritizing safety also benefits our customers by improving the reliability of our service to them and by protecting their property from damage. One of our principal objectives in achieving safety is minimizing the risk of derailments. A related business objective is reducing slow orders. When track defects exist, slow orders permit continued safe operation but at the expense of service and velocity. Accordingly, our coal customers (and all other customers) benefit if slow orders are minimized.

To achieve our safety and service goals, we have a philosophy of striving to identify and correct any potential issues before they become actual problems. Planning to prevent failure is directed at all stages of our operations: design of track and facilities, inspection and maintenance, and operating procedures and processes. To do so, we design our capital improvement projects to try to take risk out of the equation as much as possible. For example, in designing and building track for a heavy haul corridor such as our SPRB coal corridors, we install premium materials such as head-hardened rail and concrete ties because such components last longer under the heavy weights and high volumes. We also install No. 20-24 turnouts with moveable point frogs to reduce impact of coal trains moving over switches.[2] We continually conduct research and testing, along with international benchmarking, to seek out new and better ways to build and maintain the heavy-haul railroad.

Our designs also plan for efficient and regular maintenance to ensure we get the full value of those premium components and protect service to our customers. For example, we build with 20-foot track centers so that we can perform maintenance safely on one track while trains continue to run on adjacent tracks.[3] We plan for preventative maintenance such as rail grinding and surface-and-lining,[4] to realize the full-life of the track components and to avoid track outages or slow orders caused by track defects that can be prevented by such maintenance programs. Besides frequent inspections by track inspectors, we use geometry cars and rail detector cars to identify minor defects before they can become major defects and to prioritize our program maintenance.[5]

Union Pacific's proactive efforts to manage track maintenance to maximize safety and minimize disruption to service are not limited to track design and maintenance. A key part of "finding the problem before it finds you" involves equipment and shipper loading practices.

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2 David Connell describes in more detail our design specifications for the coal corridor. Connell Reb. VS at 7.

3 Even so, maintenance consumes capacity to run trains and impacts service, especially undercutting on the scale that will be required if coal dust deposits are not reduced. David Connell has explained that at current rates of accumulation, Union Pacific would have to undercut 265 miles each year and to deploy one to two undercutting gangs throughout the 214 day season when this work can be performed. (UP Op. Ev., Connell VS at 17-18). Doug Glass has described how this would impact not only coal customers but all of the other customers who depend on this high-density corridor. (UP Reply Arg., Glass VS at 6).

4 Surface-and-lining restores correct track profile but also serves as a "ballast cleaning" technique since fresh ballast is added to the track bed.

5 David Connell describes our track evaluation and preventative maintenance efforts in more detail. See Connell Reb. VS at 2.

Union Pacific staffs an entire department in its organization, called Damage Prevention, dedicated to working with its customers to promote safe loading practices, making sure shipped commodities remain in freight cars to prevent damage, derailments, and injuries. As part of upgrading our coal open-top hopper fleet, Union Pacific spent $2.4 million between 2005 and 2009 repairing gates so that they close tightly and prevent coal from leaking out the bottom. (UP Reply Arg., Beck Reply VS at 8). Our car inspectors look for leaking private cars, and we have a process to stop such cars and arrange for the car owner to repair such cars. (*Id.* at 6-7). By being proactive in our approach to safety and risk avoidance, we try to minimize the risk of derailments and other types of accidents and reduce slow orders.

Despite all that Union Pacific does to be proactive, this is not enough to prevent the rapid accumulation of coal dust in our roadbed. Left unchecked, coal dust is being deposited from passing coal cars and accumulating in our road bed, and will require increasing levels of undercutting, shoulder cleaning, and switch cleaning and replacement to remove it. The approach to coal dust that would be most consistent with our proactive approach toward all other aspects of running a safe railroad operation is to prevent the release of coal dust from the tops of moving coal cars in the first instance.[6]

When it comes to coal dust, we have even more reasons to believe it is more effective to prevent the coal dust from being deposited on railroad right-of-way in the first place than to attempt to remove it later. Even an aggressive, out-of-face undercutting program is uncertain of reaching all concentrations soon enough to prevent track damage and slow orders due to the variation in where dusting episodes occur and how coal dust accumulations can be concealed by a clean surface. In addition, undercutting, shoulder cleaning, and switch cleaning

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6 Rex Beck described how Union Pacific has already taken steps to prevent leaking from the bottom of cars. (Beck Reply VS at 6-8).

and replacement do not address the consequences of coal dust that ends up **beyond** the roadbed and **beyond** the railroad right-of-way.

The Failure of the Joint Line in May 2005 Was Caused by Heavy Precipitation Mixed with Coal Dust

Finally, I want to respond to comments made in the reply arguments submitted by Coal Shippers regarding a handful of Union Pacific documents written immediately after the two derailments that occurred on the Joint Line in May 2005 and their claim that we believed the derailments were caused by BNSF's failure to perform proper maintenance on the Joint Line track.[7] Union Pacific's initial reaction to the derailments was to blame BNSF for failing to perform necessary maintenance on the track, because Union Pacific had never seen track deteriorate as quickly and over such an expanse as the Joint Line did in May 2005. Therefore our first reaction was to assume that BNSF must have failed to perform adequate maintenance on the track. This immediate reaction was driven by our strong sense of urgency to restore the Joint Line as soon as possible. That urgency combined with our dependence on BNSF (which under the Joint Line Agreement has the sole authority to maintain the track) and the limited information available at the time, caused us to jump to conclusions that we later realized were incorrect. Those documents did not and do not reflect our final conclusion of the root cause of the Joint Line failure.

Union Pacific concluded that the cause of the Joint Line failure in 2005 was not faulty maintenance. We reached this conclusion after various Union Pacific personnel and engineering experts[8]:

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7 *See, e.g.,* Coal Shippers' Reply Arg. at 6-8; Coal Shippers Op. Arg., App. B.

8 Since 2005, Union Pacific has directly, or in conjunction with BNSF, retained numerous experts in failure analysis, ballast maintenance, soil mechanics, coal dust emissions, and weather who have studied various aspects of the cause of the Joint Line failure in 2005

1. investigated the Joint Line track including the derailment sites;
2. analyzed inspection reports, dispatcher transcripts, the history of slow orders, maintenance and derailments on the Joint Line, train volume, and weather on and near the Joint Line; and
3. considered laboratory results of broken concrete ties and coal dust in ballast.

We concluded that the failure was the result of a combination of coal dust in the ballast with heavy precipitation occurring over a short period of time after a sustained drought. Together they caused the track to become unstable very quickly. The movement of loaded coal trains over track that was no longer properly supported by the ballast caused concrete ties to quickly fail and damage adjacent ties. The two derailments on May 14 and May 15, 2005 were an early result of these conditions. This confluence of factors caused widespread failure throughout the entire length of the Joint Line of a magnitude that Union Pacific had not previously experienced or seen. The capacity of the Joint Line was dramatically reduced for many months and coal customers' demand for SPRB coal could not be met. In short, we learned that coal dust presented a unique and serious risk profile. No further track-caused derailments occurred because BNSF declared numerous and severe speed restrictions and took dramatic action to stabilize the track until track repairs and widespread undercutting could be completed.

The conclusion that BNSF did not defer maintenance is supported by a number of facts:

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and coal dust. Experienced Union Pacific engineering personnel have assisted when necessary, reviewed the experts' reports, inspected tracks and conferred with BNSF personnel on the Joint Line on how to deal with coal dust.

First, there were no track-caused derailments on the Joint Line in the years preceding the two May 2005 derailments.[9] If BNSF deferred maintaining the track, and given the volume and weight of trains moving on the Joint Line, track-caused derailments would have been more frequent.

Second, record volumes of coal moved on the Joint Line in the first quarter of 2005, immediately before the two derailments occurred. (UP Op. Arg., Connell Op. VS at 6; BNSF Op. Arg., Fox Op. VS at 4-5.) This would be inconsistent with a track that was in disrepair or where maintenance had been deferred.

Third, if there were latent defects from deferred maintenance on the Joint Line, we would have expected to see a high number of slow orders placed throughout the Joint Line in 2004 and the first quarter of 2005. Instead, Joint Line data shows that until May 2005, the frequency and extent of slow orders on the Joint Line were low and well within the range expected based on a comparison with prior years. (UP Op. Arg., Connell Op. VS at 6).

Fourth, the FRA performed a visual inspection of the Joint Line in November 2004, and a visual and geometry car inspection of the entire Joint Line in early May 2005, shortly before the derailments occurred. The reports from those inspections do not reveal an unusual number of track structure-related defects which one would expect if there were deferred maintenance. (*Id.* at 7).

In sum, a number of engineering experts, coming from diverse backgrounds and disciplines, have analyzed the cause of the May 2005 derailments on the Joint Line, and the cause of the widespread failure of the Joint Line in the same time period. Their findings have consistently supported the conclusion that both the derailments and the larger deterioration of the

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9 FRA Office of Safety Analysis Data 3.07 (www.fra.dot.gov).

Joint Line were caused by the confluence of coal dust deposits in the ballast and high amounts of precipitation in a short period in spring 2005. When mixed together, these components compromised the shear strength of the ballast, the track became unstable to the point the derailments occurred, and widespread track damage resulted.

Conclusion

The accumulation of coal dust in the roadbed over which Union Pacific moves is a very serious concern to us in light of our experience in the spring of 2005. Subsequent research has shown what coal dust can do to track ballast, particularly when combined with precipitation, over a very short period of time. This problem first emerged on the Joint Line, which carries the highest density of coal traffic in North America, and has since emerged throughout other coal corridors in the Union Pacific network. It continues to worsen. These corridors carry high volumes of freight traffic other than coal, so the impact is far-reaching. Consistent with Continuous Improvement principles emphasizing prevention activity, we believe the safest and most reliable way of dealing with coal dust is to improve coal-loading practices so that coal remains in the cars where it belongs.

VERIFICATION

I, Dennis J. Duffy, Vice Chairman - Operations of Union Pacific Railroad Company, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on this 1st day of June, 2010.

Dennis J. Duffy

Dennis J. Duffy

REBUTTAL VERIFIED STATEMENT
OF DEXTER N. MCCULLOCH

My name is Dexter N. McCulloch. I am an engineering geologist with 37 years of experience. For the past 27 years I have worked almost exclusively on railroad projects with a geotechnical component. A summary of my experience is included with my Verified Statement submitted in support of Union Pacific's Reply Evidence and Argument in this proceeding. I have been asked by Union Pacific to comment on portions of the Reply Verified Statements of Michael A. Nelson and Douglas G. DeBerg submitted in support of AECC's Reply Evidence that fall within the scope of my knowledge and experience.

In my rebuttal statement, I will address the following points. First, Mr. Nelson mischaracterizes Dr. Tutumluer's report and underestimates the problems associated with coal dust as a railroad foulant because he uses in-place specific gravity values, rather than bulk specific gravity, in his comparisons with other contaminants, and both he and Mr. DeBerg overlook other pertinent data relating to the presence of coal dust accumulations on Union Pacific lines at locations distant from the Joint Line. Second, coal dust is a foreign contaminant, unlike other track fouling agents, which are either naturally-occurring or result from the break down over time of railroad structure components. Therefore, unlike other fouling agents, coal dust accumulation can be prevented. Third, Mr. Nelson ignores the fact that any reduction of fugitive coal dust emissions will reduce the excessive amount of maintenance currently required to remove it from the railroad right-of-way, even if complete elimination is not feasible. Fourth, ground penetrating radar, as advocated by Mr. Nelson as a tool for identifying locations where coal dust is present in the ballast, is still experimental and unproven as a technique for identifying locations where coal dust is present. Fifth, the addition of parallel tracks on the Joint Line in recent years to accommodate more coal traffic has led to the potential for greater contamination with coal dust, as fugitive dust once deposited downwind of existing track now has the potential to be carried by the wind into the ballast of parallel tracks. And finally, Mr. DeBerg's contention that the Joint Line tracks were under-designed and under-built is without factual basis or support.

Nelson's Criticisms of Tutumluer Miss the Mark for Several Reasons.

In Section 1 of his reply verified statement, titled Coal Dust vs. Other Ballast Contaminants, Mr. Nelson acknowledges that coal dust, because of its low specific gravity, must be evaluated as a contaminant by the volume it occupies in the ballast section rather than by its weight.[1] (Nelson Reply VS at 2). As I discussed in my reply testimony,[2] this major difference between coal dust and other ballast contaminants means that weight-based comparisons of fouling agents underestimate the significance of coal dust as a major fouling agent. However, in his determined effort to criticize gaps that he perceives in Dr. Tutumluer's research, Mr. Nelson (1) misses completely the fully fouled volume comparison of coal dust to other contaminants, (2) uses the wrong values for specific gravity, (3) misses the pertinent point of why the difference between volume and weight is relevant, and (4) ignores the survey data that demonstrates that coal dust accounts for a significant share of fouled material at locations well beyond the Joint Line.

Nelson makes his first mistake when he criticizes Tutumluer for never reporting the results of tests involving clay or granite at the cubic volume level exhibited by coal

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1 On page 7 of his statement, Mr. DeBerg apparently disagrees with both Mr. Nelson's and Dr. Tutumluer's evaluation that coal dust needs to be evaluated in terms of volume, not weight.

2 McCulloch Reply VS at 7-8.

dust in the "25 percent by weight" test (which filled all of the voids and produced fully fouled ballast). Tutumluer in fact does include in Table 2 of his article by weight equivalents of clay (32% by weight) and mineral filler (40% by weight) that in his study resulted in "fully fouled" ballast.[3] Using these measures which account for volume differences, Tutumluer found a notable reduction in shear strength for ballast fully fouled by coal dust (224 t_{max} kPa) compared to ballast fully fouled by clay (247 t_{max} kPa) or granite (260 t_{max} kPa). In this direct volume to volume comparison, coal dust weakens ballast more than clay or mineral filler.

Nelson makes a second mistake by using the wrong values for specific gravity. Based on his evaluation of data provided by Dr. Tutumluer, Nelson states "...any given cubic volume of clay or granite ballast fines will weigh approximately 2.1 times as much as an equivalent cubic volume of coal dust." (Nelson Reply VS at 3). While I agree in principle that coal dust has a greater volume than other contaminants for its weight, Nelson underestimates the problem by using the wrong values. The specific gravities he used to calculate this 2.1 factor are the values for clay in-place and granite in-place. In the case of sand grains he mentions that he uses a specific gravity of 2.65. (Id. at 4). He notes that this is equivalent to the value for in-place granite. For coal he uses 1.3, also an in-place value. In-place specific gravity, however, is not the appropriate measurement to use when discussing the density of dust particles, which are at issue here, as opposed to clay or granite or coal as a mass.

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3 E. Tutumluer, *Laboratory Characterization of Fouled Railroad Ballast Behavior*, 3/15/09, attached to UP's Op. Ev. as Ex. DC-1 at 6. Select pages are attached to this statement as Ex. DNM-1 for ease of reference. Tutumluer notes the following: "For the coal dust fouling case, 25% coal dust by weight of aggregate was found to completely fill in the voids of the clean granite thus referred to here as 'fully coal dust fouled' condition after sample preparation. Similarly, 32% clay by weight of aggregate and 40% mineral filler by weight of aggregate were observed to completely fill in the same void space of the clean granite for the clay and mineral filler fully fouled conditions, respectively."

Bulk specific gravity, also known as bulk density, is the proper measurement when analyzing the density of dust particles. Bulk specific density is considerably different and always lower than in-place specific gravity because it is dependent on the range and distribution of particle sizes in the mix and the volume of air voids in the sample. Even larger volume factors occur when the bulk specific gravities of the broken down contaminant particles are considered. These values generally range between a low of 2.1 and a high of 3. A given volume of clay or granite fines will therefore weigh somewhat more than Nelson's stated 2.1 times the equivalent volume of coal dust. Table 2 of my reply statement identified both the specific gravity and the associated weight for a cubic foot for coal dust, broken granite (i.e., ballast fines), clay and sand particles. The values in that table demonstrate that ballast fines would weigh nearly three times as much as the same volume of coal dust.[4] A cubic foot of coal dust also weighed considerably less than the same volume of clay or sand particles. (Id.) Conversely, one pound of coal dust will occupy a much greater volume than any of these other ballast contaminants.

More importantly, Mr. Nelson and Mr. De Berg miss the point regarding the greater volume of coal dust for its weight. Nelson cites with approval to De Berg's observation that a comparison of ballast "highly fouled" by coal dust with ballast "fouled to a lesser extent by other contaminants" is meaningless or invalid, but that is a semantic sleight-of-hand that begs the question. (Nelson Reply VS at 4). "Highly fouled" ballast will always be more fouled than "lesser-fouled" ballast, whether the contaminant is the same or not. The critical point is that shippers have claimed that other fouling agents such as sand and wind-blown soil are more significant than coal dust but their claims rest on a comparison of the <u>weight</u> rather than a comparison of <u>volume</u>. (Coal Shippers Op.

4 103 lbs./cu. ft. divided by 35 lbs. per cu. ft. is 2.94.

Ev. at 2; Coal Shippers Reply Ev. at 13.) See also Tutumluer, *Laboratory Characterization of Fouled Railroad Ballast Behavior* at 2-3 (quoting Selig & Waters re: relative amount of different fouling agents)).

In my reply statement, I explained why the traditional Selig and Waters Fouling Index, which relies on weights, under-reports the degree of fouling by low density contaminants such as coal dust. (McCulloch Reply VS at 6). Specifically, I pointed out that if coal dust accounted for only 15 to 20% of ballast weight, it would comprise 45% of the ballast volume and completely fill the voids in the ballast, making it highly fouled. Yet under the Selig and Waters weight-based index, that would be considered only moderate fouling.

Most important of all, while criticizing what Dr. Tutumluer did or did not measure or compare, both Nelson and DeBerg ignored the Shannon & Wilson studies that confirmed the presence of substantial amounts of coal dust by volume in Union Pacific track from Shawnee Junction, Wyoming to Fremont, Nebraska and Marysville, Kansas.[5] Shannon & Wilson took samples of ballast every five miles on the Powder River Subdivision, every 20 miles in the subdivisions east of the Powder River Subdivision and, in addition, at several bridges, road crossings, switches and other designated locations. The documented presence of coal dust by volume supplied by these studies speaks volumes as compared to the abstract, hypothetical scenarios presented by Messrs. Nelson and DeBerg.

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5 These studies were submitted as part of Union Pacific's opening evidence as exhibits to David Connell's verified statement. Exh. DC-8 and Exh. DC-10.

Fugitive Coal Dust is a Foreign Contaminant and Therefore Can Be Avoided.

While Mr. Nelson reached an appropriate conclusion regarding the relative volume of coal dust vs. other contaminants, he then stops short of acknowledging what it means for maintaining the railroad. Both he and Mr. DeBerg dismiss coal dust as just another contaminant. Other types of contaminants that lead to fouling of the ballast, however, are products of wear of the track structure components. Granite fines and concrete fines are created from the breakdown of ballast particles and the abrasion of concrete ties, and therefore there is no practical way to prevent their occurrence. The railroads understand this well and know that wear depends on the amount of tonnage over the track.

Other potential contaminants include wind-blown sand and dust that in some places can be deposited in the track. These contaminants are also naturally-occurring and largely impractical to lessen or eliminate, although native ground cover is common throughout the coal routes and does help provide a natural screen barrier.[6] In my opinion, wind-blown contaminants represent a very small fraction of the ballast contaminants on the Joint Line and other coal routes leading out of the PRB.

There is a major difference between coal dust and all of the other contaminants cited. As stated above, normal contamination of ballast due to wear of the track structure components is based on train traffic and accumulated tonnage over the line. Fugitive coal

6 Although sub-grade materials pumping up into the ballast section is frequently as a major ballast contaminant, it has been my experience that this seldom occurs in a track with a sub-ballast layer, as is present on the Joint Line and the Union Pacific coal lines east of Shawnee Junction. When it does occur, it is generally a sign that a rigid and cracked layer is present in the sub-grade. When water seeps in to the cracks and reaches the bottom of the rigid layer, passing trains squeeze the trapped water out under high pressure, causing erosion of the top of the underlying sub-grade. The slurry that is developed is ejected upward through cracks and fouls the sub-ballast and ballast. This phenomena also can occur with frozen ground layers under a track when spring thaw begins to occur.

dust from cars, on the other hand, is a foreign substance that can be controlled. The presence of coal dust also greatly increases the rate of fouling of the ballast section by accelerating wear on the concrete ties and ballast.

In addition, coal is brittle and physically weak when compared to granite or concrete. Because of this, coal fragments break down more quickly in a ballast section compared to ballast rock fragments or concrete ties. The finer particles produced from coal impair drainage more quickly and the retained water in the track ballast accelerates the overall breakdown process.[7] This has led to a need for excessive ballast maintenance, i.e., as often as every 3-6 years vs. the industry standard of every 8-20 years. (Connell VS at 17, attached to UP's Op. Ev.).

<u>Any Reduction of Fugitive Coal Dust Will Reduce Excessive Maintenance.</u>

In Section 2 of his reply, titled <u>Continued Accumulation of Coal Dust</u>, Mr. Nelson indicates in essence that since <u>all</u> coal dust cannot be eliminated through use of toppers, etc., it is pointless to make an effort to reduce the amount of coal dust impacting the track. He further asserts that the railroads "need to plan and execute a maintenance program that is consistent with actual dust levels." While complete elimination of coal dust may not be feasible, any reduction will result in a reduction of the excessive maintenance currently required. The value of such reductions is even greater due to the difficulty in identifying the exact locations where the coal dust has accumulated and the variation in where it accumulates. Undercutting strictly on the basis of time or

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7 Based on tests performed by Dr. Tutumluer, the moisture retention capacity of coal dust is very high when compared to most fine-grained soils such as clays and silts. He also determined that the coal dust displays not only higher moisture holding capability, but also significantly lower dry density compared to most fine-grained soils. The practical implication is that once coal dust gets wet it will remain wet longer than concrete or ballast fines. E. Tutumluer, *Laboratory Characterization of Fouled Ballast Behavior*, 3/15/09, attached to UP's Op. Ev. as Ex. DC-1 at 7-8.

cumulative tonnage based on current emission levels means that much of the track might not yet require the accelerated undercutting, but the risk of the coal dust getting wet in so many locations would mandate removal of the coal dust anyway at great expense and disruption of traffic.

Mr. DeBerg states in several places in his reply statement that coal dust is only one factor in ballast fouling. (See, e.g., DeBerg Reply VS at 3). While this is true, the problem is that there is so much coal being deposited on the track, it overwhelms the other contaminants and accelerates the ballast fouling process relative to the track components.

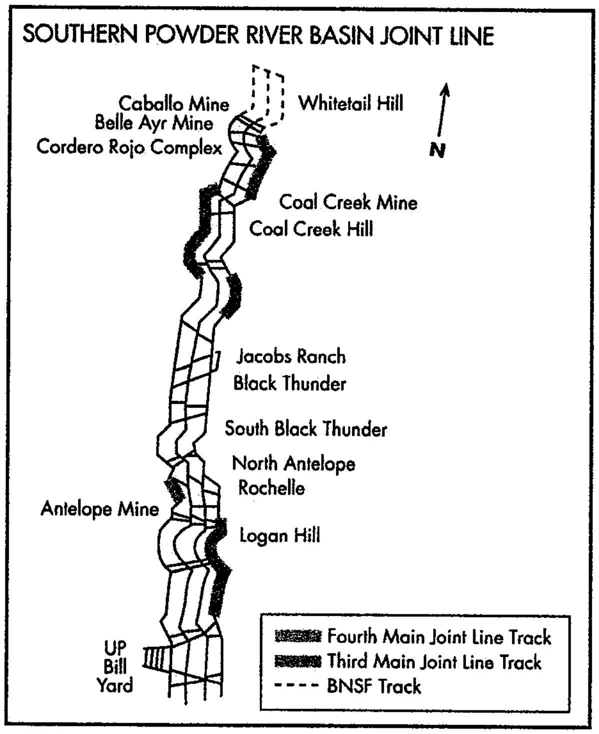
Ground Penetrating Radar is Still Experimental and Not Proven.

In Section 2B of his reply, Mr. Nelson states that the ballast condition can be determined using Ground Penetrating Radar (GPR). Though experiments with the use of GPR are currently underway, it is still in the experimental stage of development. Results can vary with rainfall events, nature and densities of contaminant particles, and other factors that are still being discovered. It is not the proven technology that Nelson makes it seem. Nelson attempts to refute Dr. Tutumluer by claiming that Dr. Tutumluer's co-authorship of two studies demonstrated the successful use of GPR to detect ballast fouling. However, a controlled study on a limited portion of track cannot be assumed to indicate the readiness of GPR for use as a front line tool to detect ballast fouling. Indeed, Dr. Tutumluer's participation on these studies should speak to his significant expertise in the field of GPR technology and bolster his position that GPR is "...for future implementation, and...is not yet a standard practice."[8]

8 As noted in Footnote 20 from the Reply Verified Statement of Michael A. Nelson.

Parallel Tracks on the Joint Line Increase Coal Dust Fouling.

The addition of parallel tracks over the years of development of the Joint Line, as reflected on the below drawing, may be leading to increased coal dust fouling in track ballast.



Westerly winds prevail in this area where the track runs in a north-south direction. In a single track arrangement, much of the fugitive coal dust is blown to the east and deposited alongside or away from the track structure. With multiple tracks, however, coal dust from a train on a westerly track has the potential to be carried by the wind to adjacent downwind tracks, leading to accelerated fouling. This new source of fouling also leads to excessive ballast maintenance.

Joint Line Track was Designed and Constructed in Accordance with Industry Standards.

Mr. DeBerg strongly criticizes the design and construction methods of the Joint Line Tracks. His statement on page 4 that the railroads "woefully under-designed the tracks" is in my opinion simply wrong. BNSF and Union Pacific design and construction standards are typically recognized as either meeting or exceeding those of AREMA (American Railway Engineering and Maintenance-of-Way Association) and its predecessor AREA. Mr. DeBerg's criticisms in this regard are addressed in greater detail in the rebuttal statement of Union Pacific's chief engineer, David Connell. (Connell Rebuttal VS at 5-7).

VERIFICATION

I, Dexter N. McCulloch, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on this 2 day of June, 2010.

Dexter N. McCulloch

Exhibit DNM-1

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LABORATORY CHARACTERIZATION OF FOULED RAILROAD BALLAST BEHAVIOR

Accepted for Publication by AR060 Railway Maintenance Committee

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Coal dust fouled granite ballast samples were prepared similar to the clean sample procedure by spreading coal dust on the ballast surface and spraying water, if needed. The individual steps are as follows:

1. Obtain clean aggregates of the same weight as previously recorded.
2. Compact ballast sample into the lower box in two lifts.
3. Obtain prescribed weight of coal dust and water (see Figure 5).
4. Spread coal dust over compacted ballast evenly in two lifts (half of material each lift). Shakedown material using vibratory compactor after each lift. If test is conducted with wet fouling material (for example, at the optimum moisture content or OMC), pour proportional amount of water over ballast after shakedown of each lift (see Figure 5). Note that this preparation procedure realistically simulated the actual coal dust accumulation in the ballast layer due to vibration caused by train loading.
5. Step 4 in the clean sample preparation procedure.

Granite samples fouled with clay were prepared following a different procedure to simulate this time subgrade intrusion. The individual steps are as follows:

1. Obtain clean aggregates of the same weight as previously recorded.
2. Obtain described weight of clay and water.
3. Place the clay in the bottom of the lower box. If test is conducted with wet clay, thoroughly mix clay with water before placing them in the lower box.
4. Place aggregates over the clay and compact in two lifts.
5. Step 4 in the clean sample preparation procedure.

For preparing granite samples fouled with mineral filler, the clean ballast and the mineral filler with designated weights were pre-mixed before placement in the lower box. The goal was to simulate the actual ballast breakdown conditions in the field. Aggregate breakdown could take place with chipped pieces and mineral filler uniformly filling the voids in ballast layer.

Before testing, the box and ring assembly were placed into the shearing apparatus. Lower box was clamped in place and load bearing plate was placed on ballast but inside upper ring. Air-bladder was placed on bearing-plate, air supply opened and normal pressure set using an in-line pressure regulator (see Figure 6). The load cell recording applied shear force was adjusted directly against the upper ring. The Labview data logger software was initiated to record normal and shear forces during testing. The loading speed was set to an input shear rate of 12.2 mm/min. (0.48 in./min.), which is approximately 4% strain per minute and the tests were run until the shear force output peaked or 15% strain has occurred.

Sample Volumetrics

After sample preparation, volumetric properties of the shear box sample were calculated based on the granite aggregate properties. It is worth noting that, for all tests, the same amount of material was used to prepare approximately the same number of aggregate contacts and the similar aggregate skeleton. That is to say, the voids available for fouling material to fill in were kept the same in all cases. This void space was found for the clean granite sample to be 43% of the total volume, which corresponds to a void ratio of 0.75 or 75% of the aggregate volume.

ASTM C29 test procedure was used for finding porosity or air voids with the known values of the specific gravity and box volume and the weight of ballast compacted.

For the coal dust fouling case, 25% coal dust by weight of aggregate was found to completely fill in the voids of the clean granite thus referred to here as "fully coal dust fouled" condition after sample preparation. Similarly, 32% clay by weight of aggregate and 40% mineral filler by weight of aggregate were observed to completely fill in the same void space of the clean granite for the clay and mineral filler fully fouled conditions, respectively.

Direct Shear Test Results

The ballast samples were sheared horizontally in the shear box under target normal pressures of 172, 241, 310 kPa (25, 35, 45 psi), typical ballast layer confining pressures, so that the relationships between the normal stress and shear stress could be established. The maximum shear stress at failure under each applied normal pressure was recorded from each test. This maximum shear stress typically occurred when approximately 10% shear strain was reached during testing. The shear strength $\tau_{max} = C + \sigma_n * \tan\Phi$ (where C is the cohesion intercept, σ_n is the applied normal stress, and Φ is the internal friction angle) expression was then developed for each ballast sample tested at a corresponding fouling fines content and moisture state.

Figure 7 shows the maximum shear stresses predicted under the applied normal stresses during shear box testing for coal dust fouling cases in comparison to the clean granite test results. As the applied normal stresses increased, the maximum shear stresses at failure or simply shear strength τ_{max} also increased primarily influenced by the ballast fouling percentage and the moisture condition of the coal dust, i.e., dry or wet at OMC = 35%. As expected, the highest shear strength values were obtained from the clean ballast at all applied normal stress levels. When ballast samples were fouled, the shear strengths typically decreased. For all the samples tested, wet coal dust fouling resulted in lower shear strengths when compared to those obtained from dry coal dust fouling. The lowest shear strength values were recorded for the fouling level of 25% by weight (fully fouled) of ballast when wet coal dust was at 35% moisture content.

Figure 8 shows the maximum shear stresses predicted under the applied normal stresses during shear box testing for clay fouling cases in comparison to the clean granite test results. Limited data were obtained due to the difficulties encountered during sample preparation especially for wet clay fouled cases. According to the test results the clean ballast sample still gave the highest strength. With clay being the fouling agent, the trend of decreasing strength with increasing fouling percentage could not be observed as clearly as in the case of coal dust fouling. In the clay fouling cases, the cohesion intercept (C) in the strength equation increased and the friction angle (Φ) typically decreased with the increasing fouling percentage, which made shear strength of samples less sensitive to varying normal stresses and confining pressures as expected. This effect was even more significant in the wet clay fouling cases, since wet clay served as a lubricant with overall much lower friction angles (Φ) obtained compared to that of the clean granite sample. It however still makes sense since the cohesion increased because of the clay paste in the voids supplies some bonding strength whereas the friction angle decreased because of the lubricating effect of clay paste within the aggregate-aggregate contact.

Figure 9 shows the maximum shear stresses predicted under the applied normal stresses during shear box testing for mineral filler fouling cases in comparison to the clean granite test results. In the dry case, results showed very similar trend to clay fouled case. Once again, the clean ballast sample gave the highest shear strength. In the dry fouling cases, the cohesion intercept C in the strength equation increased and the friction angle Φ typically decreased with the increasing fouling percentage, similar to the general trend observed for clay fouled samples. However, for the wet mineral filler tests at only 11% OMC, samples at all fouling levels behaved very close to dry conditions with the data points almost falling in the same line thus indicating that mineral filler as a fouling agent is not as sensitive to moisture as the cohesive clay.

Figure 10 compares under wet conditions the maximum shear stresses obtained from the clean granite with those of the coal dust, clay, and mineral filler fouled samples at 5%, 15%, and 25% by weight of ballast. Note that for the 25% clay fouled samples, clay moisture content was at the Liquid Limit (LL) of 37% instead of OMC, which is very close to 35% OMC of the coal dust fouled samples. Yet, the wet coal dust sample fouled at 25% gave the worst case scenario with the lowest shear stress values (biggest drop in Figure 11) among all the samples tested. Then came the wet mineral filler fouled at 25% by weight of ballast and the wet clay fouled at 15% by weight of ballast, as indicated with the dashed lines in Figure 10. This implies that railroad ballast layers fouled with coal dust contamination are at much higher risk of causing track instability and failures especially after heavy precipitation when compared to ballasts fouled due to mineral filler accumulation from aggregate breakdown or even cohesive subgrade soil intrusion.

Since the coal dust fouling was found to be the most detrimental case, a statistical analysis was performed for the significance of the different coal dust levels affecting the critical stages of ballast fouling. As described early in this paper, it is important to determine at what fouling level a significant drop in strength would be realized. In another word, there is a need to determine the reasonable dividing line between Phase I and II. For this purpose, an "F test" type statistical approach was used to evaluate the differences between the strength lines graphed in Figure 7. With a value of significance (p-value) of 0.0014 (much less than 0.05), 15% coal dust fouling was found to significantly decrease the strength of ballast. As all other strength lines in Figure 7 are below the 15% dry coal dust fouling line, 15% coal dust by weight is considered to be the critical stage of coal dust fouling in terms of ballast shear strength.

Table 2 lists cohesion intercepts (C) and friction angles (Φ) obtained from the ballast testing program. High correlation coefficients, R^2 values, were typically obtained for the established shear strength equations except for two mineral filler samples. The clean granite typically had the highest friction angle Φ of 46.6 degrees except for 47.7 degrees obtained for the low 5% dry mineral filler sample. For the case of 25% wet coal dust fouling, the friction angle computed is as low as 34.5 degrees. This value is very close to the friction angle of 33.5 degrees, obtained from a parallel research study (*11*), for the pure coal dust direct shear samples tested at OMC. Similarly, a low cohesion intercept of 35 kPa (5.1 psi) is close to the very low unconfined compressive strength of 24 kPa (3.5 psi) also obtained for the coal dust shear strength properties (*11*). This implies that the shearing action for the 25% coal dust fouled sample was mainly resisted in the direct shear apparatus by the wet coal dust governing the behavior. Again, one should note that 35% OMC condition does not represent fully saturated coal dust state. After soaking or 100% saturation, soil suction would be destroyed thus resulting in even lower strengths and unstable ballast conditions.

Table 2 also lists for direct comparison purposes the shear strength values computed under normal stress levels of 200 and 300 kPa (29.0 and 43.5 psi), typical field railroad ballast stress conditions experienced. Most of the trends already mentioned and their effects can be clearly seen by comparing the computed shear strength values. In the case of mineral filler fouled ballast, strength values from both dry and wet tests were very close which may suggest that the 11% optimum moisture had a minor effect on mineral filler fouling. On the other hand, the clay fouled ballast samples at OMC give higher strength values than the dry clay fouled samples, which implies that clayey soils at OMC have higher shear strength properties. Since most geomaterials compacted at OMC usually give the best mechanical properties, future research will need to also investigate fouled ballast behavior when moisture content increases beyond optimum conditions.

SUMMARY AND CONCLUSIONS

Large-sized shear box direct shear laboratory tests were conducted at the University of Illinois on granite ballast samples obtained from the Powder River Basin (PRB) joint line in Wyoming to measure strength and deformation characteristics of both clean (new) and fouled ballast aggregates with three different fouling agents, i.e., coal dust also obtained from the PRB joint line, plastic clay, and nonplastic mineral filler from crushing of the same granite aggregate, at various stages of fouling. The grain size distribution of the aggregate conformed to the typical AREMA No. 24 ballast gradation with a maximum size (D_{max}) of 63.5 mm (2.5 in.) and a minimum size (D_{min}) of 25.4 mm (1 in.). Each fouling material was mixed with clean aggregates for achieving fouling levels of 5%, 15%, 25%, and sometimes up to 40% by weight of ballast under dry and wet, mostly optimum moisture content (OMC), conditions. The coal dust material was spread on the clean aggregate specimen and vibrated on top to achieve its percolation into the voids in an effort to realistically simulate coal dust falling off the trains into the ballast layer in the field. The plastic refractory clay and the mineral filler were mixed with granite aggregates by means of different sample preparation techniques again to simulate realistic field fouling scenarios of subgrade intrusion and aggregate breakdown, respectively.

From the direct shear tests, the highest shear strength values were obtained from the clean ballast samples at all applied normal stress levels, which were representative of typical stress states experienced in the ballast layer under train loading. When ballast samples were fouled, the shear strengths always decreased. This was mostly apparent with lower friction angles and cohesion intercepts. Wet fouling generally resulted in lower ballast shear strengths when compared to those obtained from dry coal dust fouling. Primarily due to increasing cohesive nature, i.e., cohesion intercepts, with increasing fouling percentages, plastic refractory clay fouled samples exhibited slight shear strength increases under both dry and wet conditions. However, samples fouled with mineral filler at 5%, 15%, and 25% were somewhat insensitive to the low 11% moisture content increase from the dry condition and resulted in similar shear strength values.

Coal dust was by far the worst fouling agent for its impact on track substructure and roadbed and caused the most drastic shear strength decreases especially at high fouling levels. Through statistical evaluation, 15% dry coal dust fouling by weight of ballast was shown to be significant to cause critical fouling and decrease considerably the ballast strength. For the case of 25% wet coal dust fouling by weight of ballast, the lowest shear strength properties, internal friction angle and cohesion, obtained were equivalent to those properties of the coal dust itself at 35% OMC. Note that even more drastic strength reductions can be realized when dry coal dust, never been saturated or soaked in the field and therefore having a high suction potential, is subjected to inundation and 100% saturation.

It is still difficult to make unique conclusions on ballast fouling due to the differences between laboratory and field conditions and difficulties in sample preparation process. This

TABLE 2 Shear Box Direct Shear Strength Test Results

Fouling Agent	Percentage by Weight of Clean Ballast (%)	Moisture Condition (see Table 1)	$\tau_{max} = C + \sigma_n * \tan\Phi$		Correlation Coefficient, R^2	Shear Strength τ_{max} (kPa)	
			Cohesion "C" (kPa)	Friction Angle (Φ)		200 kPa Normal Stress	300 kPa Normal Stress
Clean	**0**	**Dry**	**72**	**46.6**	**0.96**	**283**	**389**
Coal Dust	5	Dry	80	44.4	0.99	276	374
	15	Dry	93	36.2	0.99	239	312
	25	Dry	75	36.6	0.98	224	298
	5	OMC	61	44.7	0.99	259	359
	15	OMC	77	37.7	0.99	231	309
	25	OMC	35	34.5	0.97	173	242
Clay	5	Dry	44	40.5	0.99	215	300
	15	Dry	131	31.2	0.99	252	313
	25	Dry	59	39.5	0.99	224	307
	32	Dry	114	33.7	0.97	247	314
	5	OMC	61	44.1	0.95	255	352
	15	OMC	85	38.0	0.99	241	319
	25	LL	144	36.1	0.98	290	363
Mineral Filler	5	Dry	0	47.7	0.99	195	305
	15	Dry	41	41.6	0.93	219	308
	25	Dry	94	34.6	0.85	232	301
	40	Dry	116	35.7	0.71	260	332
	5	OMC	40	42.6	0.98	224	316
	15	OMC	26	43.4	0.97	215	309
	25	OMC	66	38.0	0.98	222	300

Work Papers

2005 Relative Densities on Joint Line and UP's Powder River Subdivision

Joint Line

Shawnee Jct to E. CNW (East Bill)	UP Northbound	44
	UP Southbound	220
	BNSF Northbound	22
	BNSF Southbound	113
Total MGT		399
Ratio of MGT/Main Track Miles		399/3 = 133

E. CNW (East Bill) to Nacco Jct.	UP Northbound	44
	UP Southbound	217
	BNSF Northbound	22
	BNSF Southbound	113
Total MGT		396
Ratio of MGT/Main Track Miles		396/3 = 132

Nacco Jct. to Reno	UP Northbound	28
	UP Southbound	137
	BNSF Northbound	20
	BNSF Southbound	64
Total MGT		249
Ratio of MGT/Main Track Miles		249/2 = 124.5

Union Pacific

Shawnee Jct. to Horse Creek	UP Westbound	4
	UP Eastbound	223
Total MGT		267
Ratio of MGT/Main Track Miles		267/2 = 133.5

Source: UP Tonnage Chart for Year 2005

Average Daily Train Statistics
Beck, NE - NX281
March 2010

Train Category	Trains per Day	Freight Cars / Day	Intermodal Boxes / Day	Total Cars & Boxes
A	3	158	0	158
C	67	8,768	0	8,768
E	1	0	0	0
G	6	550	0	550
I	4	403	632	632
K	10	972	1,898	1,898
M	18	1,676	55	1,676
O	1	86	0	86
Q	4	469	4	469
S	1	25	3	25
U	0	8	0	8
W	0	13	0	13
Z	5	244	537	537
Total	**120**	**13,372**	**3,129**	**14,820**

Train Category	Trains per Day	Freight Cars / Day	Intermodal Boxes / Day	Total Cars & Boxes
Coal	67	8,768	0	8,768
Intermodal	19	1,619	3,067	3,067
All Other	34	2,985	62	2,985
Total	**120**	**13,372**	**3,129**	**14,820**

WORKTABLE D8 PART 6
GENERAL OVERHEAD AND CONSTANT COSTS
CALCULATION OF GENERAL OVERHEAD AND CONSTANT COST MARKUP RATIOS

LINE	IDENTIFICATION	SOURCE OF C1	AMOUNT (1)
601	VARIABLE EXPENSE-OPR D8	L326C5	420276
602	VARIABLE EXPENSE-DL D8	L355C5	110088
603	VARIABLE EXPENSE-ROI D8	L369C5	62701
604	VARIABLE EXPENSE-OPR D1-7	L435C1	8325920
605	VARIABLE EXPENSE-DL D1-7	L435C2	2206596
606	VARIABLE EXPENSE-ROI D1-7	L435C3	2215606
607	GOH MARKUP RATIO-OPR	(L601/L604)+1.0	1.05048
608	GOH MARKUP RATIO-DL	(L602/L605)+1.0	1.04989
609	GOH MARKUP RATIO-ROI	(L603/L606)+1.0	1.0283
610	VARIABLE EXPENSE-TOTAL-D8	L601+L602+L603	593066
611	VARIABLE EXPENSE-TOTAL D1-7	L604+L605+L606	12748123
612	GENERAL OVERHEAD MARKUP RATIO-AVERAGE	(L610/L611)+1.0	1.04652
613	TOTAL RAILWAY EXPENSE	L136C1	17563872
614	TOTAL VARIABLE RAILWAY EXPENSE	L610+L611	13341189
615	VARIABLE PORTION OF TOTAL EXPENSE	L614/L613	.75958
616	CONSTANT COST PORTION OF TOTAL EXPENSE	1.0-L615	.24042
617	CONSTANT COST MARKUP RATIO	L613/L614	1.31651

*EXCLUDING LOCAL MARINE AND OTHER SPECIAL SERVICE TERMINALS, BUT INCLUDING SWITCHING AND TERMINAL COMPANIES.

Total 17,563,872
13,341,189
Fixed 4,222,683

Year	Owner	Car-Type	Avg Load	Cars/Train	Loaded Miles	Weightings	UP Var. Cost/Ton	Ratio of Phase III To Specific	Adjusted Var. Cost/Ton	Weighted Average Adj Var. Cost/Ton	Restated Weighted Avg Var. Cost	Ratio of Restated Var Cost to Adj Var Cost
							---- Provided by Crowley's Analysis -1) ----					
2005	P	Hopper	114.5	116	991	27.66%	9.34	0.836	7.81	2.16	2.58	
2005	P	Gondola	114.5	116	991	51.52%	9.08	0.836	7.59	3.91	4.68	
2005	R	Hopper	114.5	116	991	10.57%	10.48	0.828	8.68	0.92	1.11	
2005	R	Gondola	114.5	116	991	10.25%	10.44	0.828	8.64	0.89	1.07	
										7.87	**9.44**	1.199
2006	P	Hopper	115.7	118	1004	28.85%	9.47	0.836	7.92	2.28	2.73	
2006	P	Gondola	115.7	118	1004	49.84%	9.18	0.836	7.67	3.82	4.58	
2006	R	Hopper	115.7	118	1004	10.46%	11.2	0.828	9.27	0.97	1.17	
2006	R	Gondola	115.7	118	1004	10.84%	10.6	0.828	8.78	0.95	1.15	
										8.03	**9.63**	1.199
2007	P	Hopper	116.7	119	1006	29.18%	10.15	0.836	8.49	2.48	2.96	
2007	P	Gondola	116.7	119	1006	47.74%	9.86	0.836	8.24	3.94	4.71	
2007	R	Hopper	116.7	119	1006	11.77%	12.13	0.828	10.04	1.18	1.43	
2007	R	Gondola	116.7	119	1006	11.30%	11.09	0.828	9.18	1.04	1.25	
										8.63	**10.35**	1.199
2008	P	Hopper	116	119	1026	29.38%	12.37	0.836	10.34	3.04	3.63	
2008	P	Gondola	116	119	1026	46.54%	11.99	0.836	10.02	4.67	5.58	
2008	R	Hopper	116	119	1026	11.55%	14.7	0.828	12.17	1.41	1.70	
2008	R	Gondola	116	119	1026	12.53%	13.21	0.828	10.94	1.37	1.66	
										10.48	**12.57**	1.199

(1- Source: Crowley Workpaper tab: Variable Costs

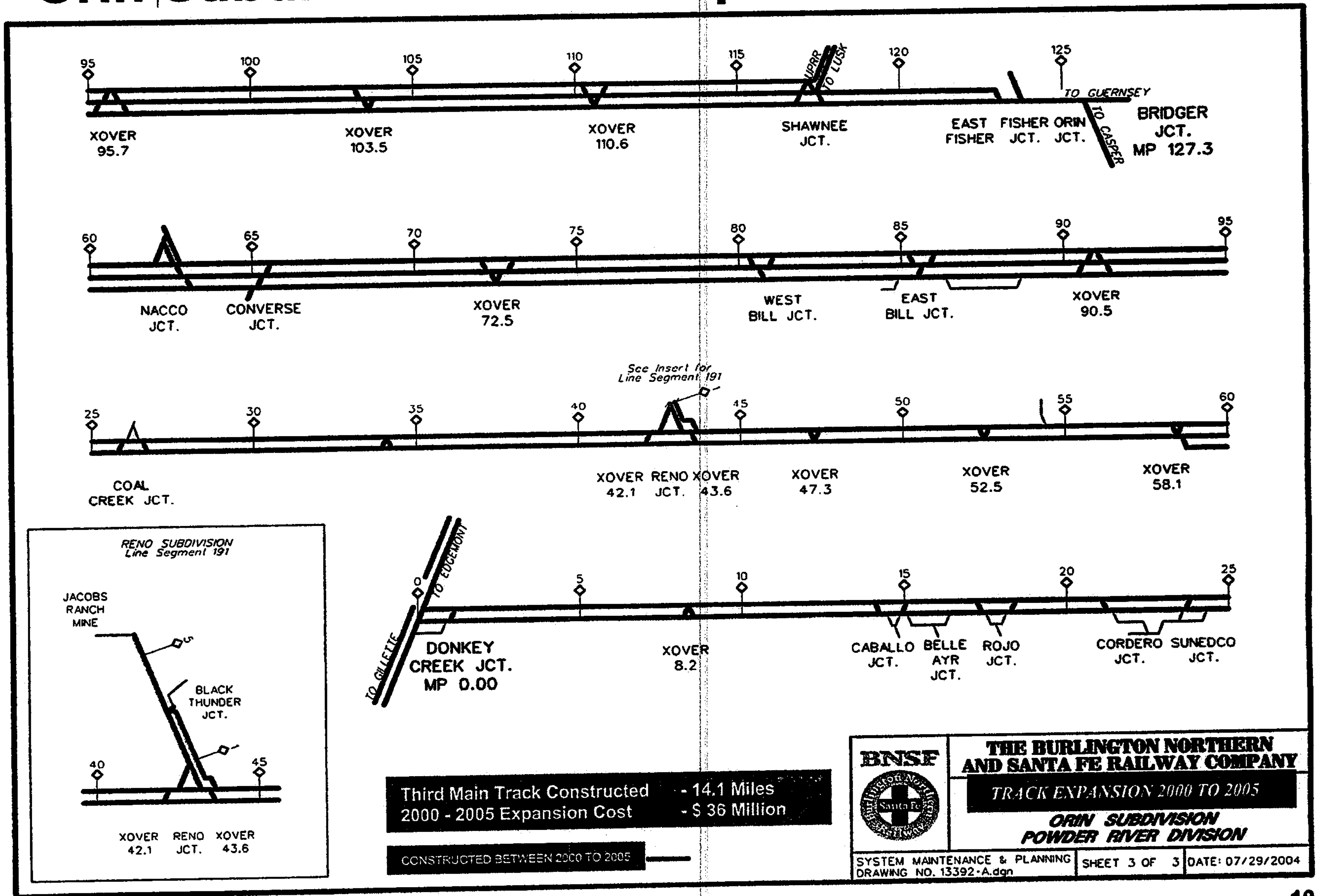
	Provided by Crowley's Analysis -1)										
Year	Revenue	Ton Miles	No. of Tons	Rev/Ton	Var Cost / Ton Mile	Adj. Aggregate Variable Costs	Adj. Aggregate Contribution	Ratio of Restated Var Cost to Adj Var Cost	Restated Variable Costs	Restated Contribution	Restated Rev / Var Costs
2005	$ 2,555,147	235,395,000	245,921,746	$ 10.39	0.007943	$ 1,869,785	$ 685,362	1.199	$ 2,241,534	$ 313,613	1.14
2006	$ 2,955,139	249,152,000	261,477,385	$ 11.30	0.007996	$ 1,992,325	$ 962,814	1.199	$ 2,388,673	$ 566,466	1.24
2007	$ 3,114,989	251,408,000	263,484,478	$ 11.82	0.008576	$ 2,156,157	$ 958,832	1.199	$ 2,585,544	$ 529,445	1.20
2008	$ 3,766,550	258,362,000	269,986,366	$ 13.95	0.010208	$ 2,637,487	$ 1,129,063	1.199	$ 3,162,964	$ 603,586	1.19
Cumulative Total							$ 3,736,071			$ 2,013,110	

$ 1,722,961 Difference between Crowley's calculation of contribution and Restatement of contribution

86% overstatement of UP's contribution

(1- Source: Crowley Workpaper tab: Aggregates

Orin Subdivision Track Expansion 2000-2005



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CERTIFICATE OF SERVICE

I hereby certify that on this 4th day of June, 2010, I have served a copy of the above Rebuttal Evidence and Argument of Union Pacific Railroad Company and accompanying Verified Statements via Federal Express on the following parties of record:

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