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June 21, 2013 June 21, 2013

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BY HAND

Ms. Cynthia T. Brown
Chief, Section of Administration
Office of Proceedings
Surface Transportation Board
395 E Street, SW
Washington, DC 20423

Re: *Review of General Purpose Costing System*, EP 431 (Sub-No. 4)

Dear Ms. Brown:

Enclosed please find corrected copies of the Highly Confidential and Public versions of the Comments of Union Pacific Railroad Company that were filed yesterday in the referenced proceeding. The corrections fix erroneous references on page 2 and page 3 to the Parts of the Comments that address particular issues.

Thank you for your assistance.

Sincerely,



Michael L. Rosenthal
*Counsel for Union Pacific
Railroad Company*

Enclosures

REDACTED – TO BE PLACED ON PUBLIC FILE

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

Docket No. EP 431 (Sub-No. 4)

REVIEW OF THE GENERAL PURPOSE COSTING SYSTEM

COMMENTS OF UNION PACIFIC RAILROAD COMPANY

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June 20, 2013

TABLE OF CONTENTS

	<u>Page</u>
I. Eliminating The Make-Whole Adjustment.....	3
A. SEM Costs	4
B. Station Clerical Costs.....	10
C. Equipment Costs for the Use of Railroad-Owned Cars During Switching	11
II. Changing E/L Ratios, I&I Switching Mileage, And Definition of Trainload	12
A. E/L Ratios	12
B. I&I Switching Mileage	13
C. Trainload Shipments	14
III. Modifying The Allocation Of Locomotive Unit Mile Costs	14
A. Unit-Train Trailing Tonnage Adjustment	14
B. Allocations to Non-Unit Train Shipments	15
IV. Broader Issues Associated With Improvements To URCS	16

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

Docket No. EP 431 (Sub-No. 4)

REVIEW OF THE GENERAL PURPOSE COSTING SYSTEM

COMMENTS OF UNION PACIFIC RAILROAD COMPANY

Union Pacific Railroad Company (“UP”) is filing these comments to address the changes to the Board’s general purpose costing system, the Uniform Railroad Costing System (“URCS”), proposed in *Review of the General Purpose Costing System*, EP 431 (Sub-No. 4) (STB served Feb. 4, 2013) (“NPRM”). UP’s comments also address the broader need to improve URCS.

There is a compelling need to update and improve URCS. The existing URCS model is based on historical statistical relationships and special studies that do not fully reflect operations of railroads today. Yet, even as URCS’s empirical underpinnings have grown further removed from current conditions, the Board has expanded its reliance on URCS in regulating the market activities of railroads. Unless URCS reflects current rail operations, the Board’s reliance on URCS may have the unintended consequence of distorting both regulatory and commercial decision-making, to the detriment of railroads, shippers, and the general public.

There are many opportunities to update and improve URCS. UP described several opportunities in comments filed in 2009, when the Board proposed a general review of URCS.¹ Earlier in 2009, UP supported the Board’s proposal to update accounting and financial reporting

¹ See Written Testimony of Union Pacific Railroad Company, *Review of the Surface Transportation Board’s General Purpose Costing System*, EP 431 (Sub-No. 3) (Apr. 23, 2009).

requirements for Class I rail carriers and refine URCS to better capture the operating costs of transporting hazardous materials.²

UP commends the Board for focusing attention on improving URCS. However, UP is concerned that many of the Board's proposals lack empirical support, so there is no reason to believe their adoption would produce more accurate costing results. In fact, UP believes that most of the proposed changes would produce less accurate results.

UP is also concerned that the Board is adopting a piecemeal approach to changing URCS without having adequately considered the complexities involved in implementing the changes it has proposed, much less a series of changes over time. The need to consider implementation issues is vitally important, as the Board has expanded reliance on system-average URCS and many of its new uses of URCS require comparisons of costs of many types of traffic over different time periods in the same proceeding.

In the comments that follow, UP first discusses the Board's specific proposals and then discusses broader issues raised by the Board's efforts to improve URCS.

In Part I, UP discusses the Board's proposal to eliminate the URCS make-whole adjustment by changing the methods of calculating unit costs for three categories of costs for which certain efficiency adjustments are made. UP does not oppose eliminating the make-whole adjustment, but it disagrees with the Board's proposed approach, which simply assumes away the existence of long-recognized cost differences involved in handling trainload shipments as compared with single-car and multi-car shipments, and multi-car shipments as compared with

² See Comments of Union Pacific Railroad Company, *Class I Railroad Accounting and Financial Reporting – Transportation of Hazardous Materials*, EP 681 (Feb. 4, 2009).

single-car shipments. UP proposes a means to eliminate the make-whole adjustment while continuing to recognize the relative efficiencies currently recognized by URCS.

In Part II, UP discusses the Board's proposals to use rail carriers' actual Empty/Loaded Ratios ("E/L Ratios") for costing trainload movements, to update the assumption that single-car and multi-car shipments receive inter-train and intra-train ("I&I") switching every 200 miles, and to define a trainload shipment as a shipment consisting of 80 cars or more. UP agrees with the Board's proposal to use carriers' actual E/L Ratios. UP also agrees with the Board's proposal to increase the distance between I&I switches but believes that 250 miles would be an appropriate distance for UP. And UP does not object to the Board's proposal to change the definition of a trainload shipment, as long as the Board continues to use actual operating characteristics to determine the type of movement when costing a limited number of shipments—for example, when costing the issue traffic in rate cases.

In Part III, UP discusses the Board's proposed adjustments to the locomotive unit-mile ("LUM") cost allocation. UP disagrees with the Board's proposals because their adoption would produce less accurate allocations of LUM costs.

In Part IV, UP discusses the importance of ensuring that changes to URCS are supported by empirical evidence, as well as the importance of planning for an orderly transition when adopting changes to URCS.

I. Eliminating The Make-Whole Adjustment

UP supports the overall objective of the Board's proposal to eliminate the make-whole adjustment, which is to account more accurately for operating costs and economies of scale as shipment size increases. UP also recognizes the Board's interest in eliminating "break points" created by the current method of applying the make-whole adjustment. But UP disagrees with the Board's proposal to calculate SEM costs and station clerical costs solely on a per-shipment

basis. UP also disagrees with the Board's proposal to disregard the agency's prior conclusions regarding efficiencies associated with the costs of using railroad-owned cars during switching. The Board's proposals ignore the realities of railroad operations and will significantly change URCS's costing results, even though there is no evidence that the changes will improve the accuracy of URCS.

In the sections below, UP proposes an alternative approach to eliminating break points that is designed to reflect operating realities by continuing to recognize the relative efficiencies involved in handling shipments of different sizes.

A. SEM Costs

The Board's proposal to calculate SEM costs solely on a per-shipment basis incorporates two assumptions that do not reflect the realities of railroad operations. First, the Board's proposal assumes that the variable costs to switch a single car are the same as the costs to switch a two-car block, a ten-car block, or a 135-car unit train. *See* NPRM at 5. However, the time required for switching is a significant component of the variable portion of switching costs, and it generally takes longer to switch more cars, even if they are moving together in a single block.³ UP believes there are usually economies of scale as shipment size increases—that is, on average, the costs to switch a two-car block are not twice those to switch a single car. But the existence of economies of scale does not mean the costs to switch an entire unit train are the same as those

³ For example, longer cuts take more time to clear a switch and to be spotted during switching. In addition, when train crews inspect trains or perform a brake tests as they build local trains, more time is required when more car are involved.

to switch a single car.⁴ Adoption of the Board's proposal would eliminate URCS's recognition of meaningful differences in switching costs associated with shipments of different sizes.⁵

Second, the Board's proposal incorrectly equates the number of cars moving under the same waybill from origin to destination with the number of cars a railroad switches in one event. *See* NPRM at 5. Typically, when UP pulls cars from an industry, it pulls all the outbound cars, regardless of how they are waybilled or their destinations. Similarly, when UP spots cars at an industry, it spots all the inbound cars, regardless of how they are waybilled or their origins. Moreover, even if a shipper releases several cars on the same day for different destinations on separate waybills, those cars may be switched together at a classification yard if they are bound for the same block and/or the same connecting carrier.⁶ Adoption of the Board's proposal would elevate form over substance: switching costs per car for a single-car shipment would be twice as high as the costs per car for a two-car shipment, even when all three cars move on the same train from origin to interchange. Such an outcome would be inconsistent with the Board's recognition that costing should be "determined by the characteristics of the actual movement rather than the

⁴ Indeed, many trainload shipments require switching to break the train into cuts to be delivered, and then the cuts of cars must be reassembled to build the empty return train. *See, e.g., Wisc. Power & Light Co. v. Union Pac. R.R.*, 5 S.T.B. 955, 992-93 (2001); *see also* Union Pacific's Opening Evidence Vol. 1 at 29-46, *N. States Power Co. Minn. v. Union Pac. R.R.*, STB Docket No. 42059 (July 19, 2002) (attached hereto as Appendix A) (describing the process of switching issue traffic at the two destination plants in the case); Union Pacific's Opening Evidence Vol. 1, Verified Statement of Robert W. Lenzer at 1-11, *FMC Wyo. Corp. v. Union Pac. R.R.*, STB Docket No. 42022 (Jan. 15, 1999) (attached hereto as Appendix B) (describing the process of switching issue traffic at destinations in the case).

⁵ Information relating to UP's experience regarding the time required to switch larger blocks of cars is verified by Richard A. Gray, General Director, Asset Planning for UP's Network Planning and Operations Department.

⁶ *See, e.g., FMC Wyo. Corp. v. Union Pac. R.R.*, 4 S.T.B. 699, 754-55 (2000) (describing blocking of eastbound soda ash carloads at North Platte for interchange at Chicago).

peculiarities of a carrier’s invoicing practices.” *State of Montana v. BNSF Ry.*, NOR 42124, slip op. at 5 (STB served Apr. 26, 2013).

Adoption of the Board’s proposal would alter significantly the allocation of switching costs among single-car, multi-car, and trainload shipments. Specifically, single-car shipment variable costs would increase relative to unit-train shipment variable costs and system-average variable costs. UP’s Table 1 illustrates this effect, using an example of a railroad that has 100 carloads moving as a unit train and 300 carloads moving as single cars, where total switching costs are \$400 (and thus system-average switching costs are \$1.00 per car):

Table 1
Comparison of Switching Cost-Allocations
Under the Current URCS Approach and the Board’s Proposal

	Total Cars	Current URCS Approach (75% Reduction, Make-Whole)			Proposed URCS Approach (Counting Shipments as Single Cars)		
		Costs	% of Total Costs	Cost per car	Shipments	% of Total Costs	Cost per car ⁷
Unit Train	100	\$25	6.3%	\$0.25	1	0.3%	\$0.013
Single Cars	300	\$300 +\$75	93.8%	\$1.25	300	99.7%	\$1.33
Total	400				301		

The example necessarily simplifies railroad operations, but it demonstrates the consequences of the Board’s proposal. The 1:3 ratio of cars moving in unit trains and cars moving as single cars is based on data from UP’s Annual Report R-1. The example shows that adopting the Board’s proposal would shift switching costs from cars moving in unit trains to cars moving in smaller shipments—essentially proclaiming that shipments in unit trains are substantially more efficient in relation to single-car shipments than indicated by the current methodology. Assuming system-

⁷ Under the Board’s proposed approach, the cost per switching event would be approximately \$1.33 (\$400 in total switching costs divided by 301 events). The cost per car for switching a 100-car unit train would thus be approximately \$0.013 (\$1.33 per event divided by 100 cars).

average switching costs of \$1.00 per car, the costs for unit train shipments would fall from \$0.25 per car under the current approach to \$0.013 per car under the proposed approach. Viewed from a different perspective, the costs for single-car shipments would rise from \$1.25 per car under the current approach to \$1.33 per car under the proposed approach—that is, from 125% of system-average costs to 133% of system-average costs.

UP is not aware of any empirical evidence supporting the proposition that switching for single-car shipments has become less efficient relative to system average costs. To the contrary, in the Board’s 2010 report to Congress regarding potential modifications to URCS, the Board proposed revisiting the make-whole adjustment in response to concerns “that the current method” was producing “an upward distortion of the single-car shipment variable costs.”⁸ In fact, the Board contemplated making revisions to the make-whole adjustment that “would result in smaller cost reductions for the volume shipments ... and smaller cost additions to the single-car shipments.”⁹ The NPRM does not explain why the Board’s proposal would produce results so different from those the Board anticipated in its report to Congress.

URCS is overdue for updating, but the Board should not adopt changes to URCS that would produce fundamentally different results than current methods without evidence that the changes will improve URCS’s overall accuracy. In this proceeding, the Board has focused on eliminating a largely inconsequential quirk associated with the make-whole adjustment—the existence of break points between 5-car and 6-car shipments and between 49-car and 50-car shipments—while failing to consider adequately whether the change would improve accuracy overall or introduce inaccuracy.

⁸ Surface Transportation Board, *Surface Transportation Board Report to Congress Regarding the Uniform Rail Costing System* 19 (May 27, 2010).

⁹ *Id.*

If the Board is determined to eliminate the break points associated with the make-whole adjustment but is unwilling or unable to gather the evidence necessary to re-evaluate the relative efficiencies of single-car, multi-car, and unit train shipments, then it should adopt a method of allocating SEM costs that preserves URCS's recognition of the relative efficiencies associated with handling shipments of different sizes while better reflecting real-world railroad operations. UP believes that a more appropriate approach would be to divide SEM costs into an event-related component and a shipment size-related component. Under this approach, the Board would:

1. Set the event-related component equal to the SEM costs per car for single-car shipments developed using the current make-whole methodology;
2. Set the shipment size-related component equal to the SEM costs remaining after assigning event-related costs to all shipments, divided by the number of cars moving in shipments of two or more cars.¹⁰

Essentially, UP's approach treats the current SEM costs for a single-car shipment as the costs of a switching "event," and then adds a much lower cost per car for each additional car. The consequences of applying UP's proposal are illustrated in Table 2, below:

¹⁰ In the example in Table 2, under UP's proposal, the cost of a switching event would be \$1.25, and the cost of switching an individual car in a shipment of two or more cars would be \$0.2375, or $(\$400 - \$376.25)/100$. The \$376.25 is the total number of events (301) multiplied by the cost per event (\$1.25).

Table 2

**Comparison of Switching Cost-Allocations
Under the Current URCS Approach, UP's Proposal, and the Board's Proposal**

	Total Cars	Current URCS Approach			UP's Proposal			Board's Proposal		
		Costs	% of Total Costs	Cost per car	Shipments	% of Total Costs	Cost per car	Shipments	% of Total Costs	Cost per car
Unit Train	100	\$25	6.3%	\$0.25	1	6.3%	\$0.25 ¹¹	1	0.3%	\$0.013
Single-Cars	300	\$300 + \$75	93.8%	\$1.25	300	93.8%	\$1.25	300	99.7%	\$1.33
Total	400				301			301		

UP's approach has the benefits of (i) recognizing the existence of economies of scale through use of an event-related component and incorporation of existing efficiency adjustments; (ii) recognizing the operating reality that that total switching costs continue to rise as shipment size increases; and (iii) eliminating break points created by the current method of applying the make-whole adjustment.

No approach to calculating unadjusted URCS system-average costs can precisely calculate SEM costs for every individual shipment. The relationship between the costs of switching a single car and the costs of switching multiple cars or a unit train will differ from location to location and from customer to customer. In addition, use of a waybill-based definition of "shipment" to assign the event-related component of SEM costs to cars moving in shipments of two or more cars will often understate the number of cars actually switched as one

¹¹ Under UP's proposed approach, the cost per car of switching for a 100-car unit train would be \$0.25 per car (\$1.25 for the switching event, plus 100 cars times \$0.2375 per car for the cars moving in shipments of two or more cars, divided by 100 cars).

block.¹² However, UP's approach would better reflect the realities of railroad operations than the Board's proposal.

B. Station Clerical Costs

The Board's proposal to calculate station clerical costs on a per-shipment basis suffers from the same fundamental flaws as the proposed per-shipment approach to calculating SEM costs. Although there are economies of scale with regard to some clerical costs when multiple cars are shipped under a single waybill, the expenses that URCS treats as station clerical costs include many costs that vary with the number of carloads handled by a railroad, rather than the number of waybills processed by a railroad.

URCS station clerical costs are developed from the operating expenses reflected in lines 518 and 519 of Schedule 410. These operating expenses include, among other things, salaries and wages for employees in UP's National Customer Service Center ("NCSC").¹³ The work these employees perform varies depending on both the number of shipments and the number of cars shipped. NCSC personnel address issues that arise when cars are delayed or misrouted or damaged en route, and such incidents are driven by the number of cars the railroad moves, not the number of waybills issued. For example, when a car is bad-ordered and removed from an outbound train, work orders have to be prepared by railroad personnel so that the repaired car

¹² Use of the Board's proposed definition is less problematic under UP's proposal because the use of a shipment size-related component means there would be less of a sharp break in the costs per car for single-car shipments as compared to multi-car and trainload shipments.

¹³ Information regarding the types of expenses reflected in lines 518 and 519 of Schedule 410 is verified by Carrie J. Powers, Senior Director of Financial Analysis and Reporting for UP's Finance Department.

can resume movement and be delivered later. NCSC personnel will also contact the customer to provide information about their bad-ordered cars.¹⁴

Adopting the Board's proposal would change the allocation of costs among single-car, multi-car, and trainload shipments in the same direction as would adopting the Board's proposal regarding SEM costs—that is, single-car shipments would suddenly become even more costly in relation to multi-car and trainload shipments than they appear based on current efficiency adjustments and the make-whole adjustment.

The Board should calculate station clerical costs using the same approach UP proposes for calculating SEM costs. That is, it should divide costs into an event-related component and a shipment size-related component. As discussed above, this approach would eliminate break points while recognizing both the existence of some economies of scale and the reality that station clerical costs do continue to rise as shipment size increases.

C. Equipment Costs for the Use of Railroad-Owned Cars During Switching

The Board's proposal to eliminate URCS's recognition of certain efficiencies that apply to car ownership costs when switching multi-car and trainload shipments in railroad-owned cars appears to reduce the overall accuracy of URCS.¹⁵ In the NPRM, the Board asserts that "it does not appear that there are efficiencies associated with these costs." NPRM at 6. However, the agency has previously reached the opposite conclusion. *See Investigation of Railroad Freight Rate Structure Coal*, 345-I I.C.C. 71, 227-28 (1974). The Board offers no evidence that the

¹⁴ Information regarding the types of work performed by employees in UP's NCSC is verified by John J. O'Leary, Assistant Vice President for UP's National Customer Service Center.

¹⁵ The existing efficiency adjustment for use of railroad-owned cars during switching applies only to railroad-owned cars because URCS does not calculate any time-related equipment costs for use of private cars (all such costs are assigned to miles).

efficiencies it previously recognized have disappeared, nor any reason even to think that they might have disappeared.

The Board should calculate equipment costs for the use of railroad-owned cars during switching in the same way UP proposes for calculating SEM costs and station clerical costs. That is, it should divide the costs into an event-related component and a shipment size-related component. As discussed above, this approach would eliminate break points while continuing to recognize that lower-cost characteristics of trainload and multi-car movements.

II. Changing E/L Ratios, I&I Switching Mileage, And Definition of Trainload

UP supports the Board's proposals to use actual E/L ratios for trainload movements and to update I&I switching mileage. Both changes would improve the accuracy of URCS. UP does not object to the Board's proposed change to the definition of a trainload shipment, as long as actual operating characteristics are used to determine the type of movement when costing a limited number of movements—for example, costing the issue traffic in a rate case.

A. E/L Ratios

UP supports the Board's proposal to calculate E/L ratios for trainload movements based on railroad data, rather than assuming an E/L ratio of 2.0. As the Board recognizes, there are several reasons why loaded car miles may not precisely equal empty car miles for all trainload movements. *See* NPRM at 7 n.10. UP is not aware of any reason why use of an assumed E/L ratio of 2.0 would produce more accurate results on average than use of carriers' actual E/L ratios. UP also notes that the use of actual E/L ratios would be necessary for the Board to eliminate the make-whole adjustment.¹⁶

¹⁶ When the Board assumes an E/L ratio of 2.0 and actual carrier data reflect higher or lower ratios, the difference must be addressed to prevent a disconnect between carriers' total car mile (continued...)

B. I&I Switching Mileage

UP supports the Board's proposal to update the I&I switching mileage assumption in URCS. In the NPRM, the Board encouraged parties to submit data regarding appropriate I&I switching mileage. *See* NPRM at 8. UP has studied shipments on its system and determined that, on average, I&I switching of single-car and multi-car shipments, excluding intermodal shipments, occurs approximately every 250 miles. The 250-mile figure reflects an analysis of two years of traffic data showing that shipments on UP move an average of approximately 750 miles and receive an average of 3.0 switches per car while on UP.¹⁷

UP urges the Board to update the I&I switching mileage assumption using actual carrier data, rather than the 320-mile figure proposed in the NPRM. The Board should not simply assume the average distance between I&I switches has increased in direct proportion to the increase in the average length of haul since 1990—*i.e.*, that, as length of haul increased, railroads nonetheless perform the same amount of I&I switching they performed in 1990. Length of haul has likely increased in large part because consolidations allowed traffic moving from origins on one merging carrier to destinations on the other in single-line service—*i.e.*, without an interchange. However, I&I switching also likely increased as a result of consolidations. In certain situations, I&I switches likely replaced interchanges: switching was still needed to combine shipments from separate origins on each pre-merger carrier to destinations served by only one of them.

costs and carriers' total car miles. Currently, the Board uses make-whole adjustments to address the difference.

¹⁷ A table showing the results of this study at the two-STCC level is attached as Appendix C, which is designated as "Highly Confidential." The data regarding I&I switching are verified by Justin R. Haugen, General Director of Operating Services for UP.

As UP's evidence shows, the Board's proposed I&I switching mileage assumption would be misstated by nearly 30% in the case of UP.

C. Trainload Shipments

UP does not object to the Board's proposal to define trainload shipments as shipments consisting of 80 cars or more. UP does have a significant number of trainload movements that occur as shipments of fewer than 80 cars. However, as long as URCS uses the number of cars in a shipment to define trainload shipments, a line must be drawn at some point. UP believes that 80 cars is reasonable place to draw the line, as long as actual operating characteristics are used to determine the type of movement for costing purposes when it is practicable to do so—for example, for the issue traffic in a rate case.

III. Modifying The Allocation Of Locomotive Unit Mile Costs

UP strongly opposes the Board's two proposed modifications to how URCS currently allocates LUM costs (primarily, locomotive ownership, fuel, and maintenance costs). Both proposed modifications would reduce the accuracy of URCS.

A. Unit-Train Trailing Tonnage Adjustment

Currently, URCS adjusts LUM costs for unit train traffic based on the relative weight of the shipment being costed to the system-average unit train weight (the "trailing ton adjustment"), so that heavier trains are assigned more LUM costs than lighter trains. The Board has proposed to eliminate this adjustment, asserting that use of system-average LUM costs for all unit trains "should be more accurate than the current approach." NPRM at 9. UP strongly disagrees with the assertion that ignoring differences in train weight would produce more accurate costing results.

The Board's current approach properly recognizes that, on average, heavier trains have higher LUM costs than lighter trains. The NPRM identifies no evidence that calls the current

approach into question. Indeed, train tonnage drives UP's assignment of locomotives to trains. Different types of locomotives provide different amounts of tractive effort, and different routes have operating conditions that require different levels of tractive effort, but in general, heavier trains require more locomotives and thus have higher LUM costs than lighter trains. Moreover, heavier trains generally consume more fuel than lighter trains, which is another reason why heavier trains have higher LUM costs than lighter trains.¹⁸

A more direct approach to allocating LUM costs accurately would be to allocate the costs based on the actual number of locomotives used to power a train. UP has repeatedly encouraged the Board to allow such movement-specific adjustments in individual cases. In fact, the Board's URCS Phase III program allows users to input the actual number of locomotives used to move the shipment being costed.¹⁹ However, if the Board remains unwilling to allow adjustments to system-average URCS to reflect the actual number of locomotives used, it should retain the trailing ton adjustment as the best available proxy.

B. Allocations to Non-Unit Train Shipments

Currently, URCS allocates LUM costs for single-car and multi-car shipments on the basis of relative shipment weight. In the NPRM, the Board has proposed to switch from an allocation based on relative weight to an allocation based on the number of cars in the shipment relative to the minimum number of cars in a trainload shipment, which the Board proposes to define as 80 cars. *See* NPRM at 9. UP disagrees with the Board's suggestion that this change would reflect an improvement in costing.

¹⁸ Information regarding UP's assignment of locomotives and locomotive fuel consumption is verified by James B. Rose, Superintendent of Locomotive Management for UP's Harriman Dispatching Center.

¹⁹ *See* Surface Transportation Board, Railroad Cost Program 27 (Dec. 2011).

First, as discussed above, shipment weight has a causal connection to LUM costs. If the Board's objective is to allocate costs as accurately as possible to the activity that causes the cost, shipment weight is a more accurate means of allocating LUM costs than the number of cars in a shipment. In this instance, however, accuracy appears to be taking a back seat to the Board's desire to "produce a smooth cost function." *Id.* at 10.

Second, the Board's proposal lacks an empirical basis. Rather than allocate LUM costs on the basis of relative shipment weight using railroad-specific figures that are updated each year based on actual reported data, the Board is proposing to allocate LUM costs relative to an 80-car measure that appears to be based on speculation and that both overstates and understates the average actual train size for particular railroads.

IV. Broader Issues Associated With Improvements To URCS

UP has long urged the Board to update and improve URCS. UP therefore commends the Board for commencing this proceeding. However, UP urges the Board to consider two general issues as it contemplates its next steps.

First, the Board should ensure that any proposals it adopts will produce more accurate costing results. UP believes that URCS's empirical underpinnings have grown removed from the realities of current railroad operations. However, any changes to URCS that alter basic costing relationships must be supported by empirical evidence; they must not be based on assumptions and suppositions. Failure to rely on empirical evidence would violate the principles that guided

URCS's development,²⁰ as well as the federal policy "to ensure the availability of accurate cost information in regulatory proceedings."²¹

A few of the changes proposed in the NPRM plainly hold the promise of producing more accurate results, namely, the proposals to update I&I switching miles and use actual E/L ratios. However, many of the NPRM's proposals were designed to eliminate minor quirks in URCS's current methods of recognizing certain efficiencies and other relationships, with little regard for whether they improve the overall accuracy of URCS. As a result, the Board throws out the baby with the bathwater. For example, to eliminate a "step function" between switching costs for 49-car shipments and 50-car shipments, the Board simply assumes there are no additional switching costs as shipment size increases. Similarly, to eliminate a "step function" between LUM costs for 49-car shipments and 50-car shipments, the Board disregards the longstanding recognition that heavier trains generally have higher LUM costs. URCS is based on empirical evidence regarding the relationship between railroad operations and costs. In the absence of newer and better evidence, the Board should not alter the basic cost relationships currently reflected in URCS.

Second, the Board should not propose changes to URCS without addressing how it plans to incorporate the changes into the many uses of URCS and ensure an orderly transition. The Board has been steadily increasing its reliance on system-average URCS since 2006. URCS costs are used to allocate cross-over revenue and to calculate prescribed rates in stand-alone cost cases and simplified stand-alone cost cases. They are used to calculate all three benchmarks in

²⁰ See Railroad Accounting Principles Board, Railroad Accounting Principles: Final Report (Volume 2) (Sept. 1, 1987) at 21-22 (discussing the Data Integrity Principle); *id.* at 9-11 (discussing the Causality Principle).

²¹ 49 U.S.C. § 10101(13).

Three-Benchmark cases. They are used in the new limit price test for market dominance that applies to all rate cases. And the Board is currently studying a proposal for forced access rules that rely on URCS.

Although some of the Board's uses of URCS require only one year of cost calculations, Three Benchmark cases, RSAM and $R/VC_{>180}$ calculations require the use of multiple years of data, and rate prescriptions would seem to require the use of a consistent costing methodology across time. In addition, many of these uses require costing multiple commodities moving in a variety of shipment sizes, which makes it important to maintain existing cost relationships in the absence of evidence that the relationships have actually changed. Before the Board changes URCS, it should explain and seek comments on its plans for an orderly transition.²²

Moreover, because of the transitional issues involved when changes are made to URCS, the Board should carefully consider its apparent plan to make piecemeal adjustments to URCS. UP hopes the Board's plans for considering changes to URCS extend beyond this one effort to eliminate make-whole adjustments. UP believes the Board should be considering much more substantive changes, including changes to better capture the costs of transporting hazardous materials, such as the costs of extra handling and Positive Train Control. However, each time the Board makes a change to URCS, it will face the transitional issues discussed above. For that reason, the Board should carefully consider whether it would be more efficient to institute a single proceeding to address a broader array of proposals than those set forth in the NPRM.

²² If the Board were to change URCS without addressing transitional issues, the uncertainty would likely lead to more rate litigation, because railroads and shippers might well have different expectations about how the Board would resolve the issue in an actual case—that is, they might have different expectations about whether a certain level of rates would be found unlawful.

Respectfully submitted,

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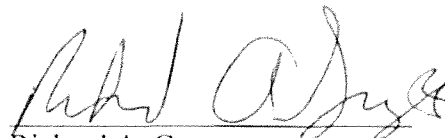
June 20, 2013

VERIFICATIONS

VERIFICATION

I, Richard A. Gray, General Director, Asset Planning for Union Pacific Railroad Company's Network Planning and Operations Department, declare under penalty of perjury that I have read the foregoing Comments of Union Pacific Railroad Company and that the information relating to Union Pacific's experience with switching times associated with different shipment sizes set forth in Part I.A is true and correct. Further, I certify that I am qualified and authorized to file this Verification.

Executed on June 20, 2013.



Richard A. Gray

VERIFICATION

I, Justin R. Haugen, General Director of Operating Services, declare under penalty of perjury that I have read the foregoing Comments of Union Pacific Railroad Company and that the facts and information relating to the average distance between switches for manifest traffic on Union Pacific set forth in Part II.B and in Appendix C are true and correct, to the best of my knowledge, information, and belief. Further, I certify that I am qualified and authorized to file this Verification.

Executed on June 20, 2013.

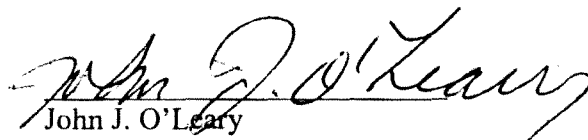


Justin R. Haugen

VERIFICATION

I, John J. O'Leary, Assistant Vice President for Union Pacific Railroad Company's National Customer Service Center, declare under penalty of perjury that I have read the foregoing Comments of Union Pacific Railroad Company and that the information regarding the types of work performed by employees in Union Pacific's National Customer Service Center set forth in Part I.B is true and correct. Further, I certify that I am qualified and authorized to file this Verification.

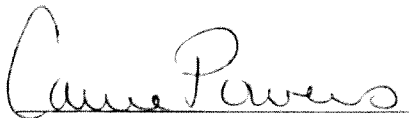
Executed on June 20, 2013.


John J. O'Leary

VERIFICATION

I, Carrie J. Powers, Senior Director of Financial Analysis and Reporting for Union Pacific Railroad Company's Finance Department, declare under penalty of perjury that I have read the foregoing Comments of Union Pacific Railroad Company and that the information relating to the type of expenses reflected in Lines 518 and 519 of Union Pacific's Schedule 410 in Part I.B. is true and correct. Further, I certify that I am qualified and authorized to file this Verification.

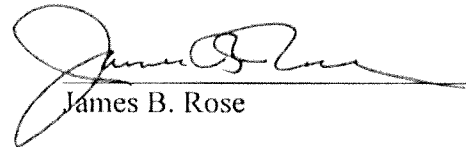
Executed on June 20, 2013.


Carrie J. Powers

VERIFICATION

I, James B. Rose, Superintendent of Locomotive Management for Union Pacific Railroad Company's Harriman Dispatching Center, declare under penalty of perjury that I have read the foregoing Comments of Union Pacific Railroad Company and that the information relating to Union Pacific's assignment of locomotives and locomotive fuel consumption set forth in Part III.A is true and correct. Further, I certify that I am qualified and authorized to file this Verification.

Executed on June 20, 2013.



James B. Rose

APPENDIX A

NORTHERN STATES POWER COMPANY MINNESOTA,	)	
	)	
Complainant,	)	
	)	
v.	)	Docket No. 42059
	)	
UNION PACIFIC RAILROAD COMPANY,	)	
	)	
Defendant.	)	
	)	

The complaint filed by Northern States Power Company Minnesota d/b/a Xcel Energy (“NSP”) challenges the reasonableness of the rail transportation rates charged by defendant Union Pacific Railroad Company (“UP”) for movement of coal from the Powder River Basin (“PRB”) to NSP’s Allen S. King plant (“King”), located at Bayport, Minnesota, and NSP’s Black Dog plant (“Black Dog”), located at Burnsville, Minnesota. NSP also challenges the reasonableness of UP’s rate for the movement of PRB coal to the King plant from a UP interchange at East Minneapolis, Minnesota, with The Burlington Northern and Santa Fe Railway Company (“BNSF”). NSP fails to recognize the full costs of UP’s service, which include time- and resource-consuming operations in the Twin Cities area that are magnified because NSP’s plants cannot unload trains efficiently.

4

St. Paul to East Minneapolis, picks up the locomotives, and attaches them to the rear of the NSP train. On other occasions, the helper crew will wait for the train at East St. Paul, a point just east of Westminster.

After the helper crew attaches its locomotives to the train, the lead crew on the BNSF locomotives requests permission from the BNSF dispatcher to enter BNSF's mainline. This is the same mainline that carries BNSF transcontinental traffic between Hoffman Yard and Westminster, so delays may occur. CP also has trackage rights on this line. Once the crew obtains authority to use the BNSF mainline, the train travels east on BNSF tracks to Westminster, where it reaches UP's Altoona Subdivision. From Westminster to Lakeland Jct., the route is identical to that used by UP trains from South St. Paul.

TWIN CITIES PART III: Delivering and Retrieving Trains at the King Plant

We now describe how UP trains arriving at Lakeland Jct. deliver coal to the King plant and how UP retrieves empty coal cars from the King plant for movement back to the PRB. As we will explain, this service requires complex switching and is subject to numerous operating constraints. It also requires moving every train back and forth across a swing bridge over the St. Croix River.

UP serves the King plant from the former Chicago and NorthWestern Railway ("CNW") Stillwater Branch, now known as the Stillwater Industrial Lead. The switch leading to the King plant is located approximately 3.8 miles up the Lead from Lakeland Jct. See Map. No. 3, UP Route to King Plant. The track runs at water level beside the St. Croix River, but several physical elements affect switching at the plant.

First, just over two miles north of Lakeland Jct., a private road crosses the track to serve a resort community. The road also reaches an extensive marina for recreational boats. We will call this the Marina Crossing. UP cannot block this crossing while switching the King plant.

Second, occupying the land north of Marina Crossing and south of the King plant is the sprawling Andersen Window factory. Andersen uses buildings on both sides of the track, and a constant flow of forklifts, trucks, shuttle vans, and pedestrians crosses the track. UP's operations at the King plant cannot block this crossing either. In fact, UP cannot switch in this area at all from 5:30 a.m. to 7:00 a.m., from 2:00 p.m. to 3:00 p.m., and from 10:30 p.m. to 11:00 p.m., while Andersen changes shifts. Otherwise, Andersen employees would be unable to reach or leave their jobs for extended periods. UP must dispatch trains to the King plant to avoid these curfews, or the crews will run out of time.

Third, the King plant does not have a loop track for efficient unloading of coal. See Map No. 5, King Plant, and Photograph No. 4. Nor does it have double-ended tracks, such as those at the Black Dog plant, which make switching easier. Instead, the King plant's rail yard consists of five stub-end tracks with capacities ranging from 20 to 27 cars each. Photographs No. 5 and 6 show the King plant trackage. This inefficient layout complicates switching. UP has a two-track yard adjacent to the NSP yard to assist the switching operation, but the combination of the Marina Crossing, the Andersen restrictions, and the short length and configuration of King plant tracks complicate switching at this plant and add to the expense of serving NSP. UP's switching study shows that switching at the King plant required an average of 2.34 minutes per car.

Switching the King plant is especially complex when, as happens more often than not, UP must deliver a loaded train and retrieve an empty train on the same trip. We will first

describe this complex process, known to train crews as the “Double Duty.” Then we will describe the somewhat simpler task of delivering a train when the plant tracks are empty. Finally, we will describe the process of retrieving an empty train. For those who may be interested, we provide detailed movement-by-movement descriptions, but we use a format that allows others to skip the details.

“Double Duty” at the King Plant. Local operating personnel refer to placing of a loaded train and pulling an empty train on the same trip as the “Double Duty.” During UP’s special study, the Double Duty was performed on two-thirds of the trips to the King plant.

The Double Duty can be performed in many ways. The method described in the following paragraphs is the most efficient and the more common method, so we calculated costs on that basis. Our description reflects placement and retrieval of 114-car trains, the largest the King plant can hold. Interline movements normally involve 110 cars, and UP movements are often 112 cars, but UP personnel handle the King trains in the same manner regardless of the number of cars. The detailed steps listed below show how the two train crews and two sets of locomotives perform an intricate, coordinated ballet to serve NSP’s King plant. Please refer to Map No. 5, King Plant.

STEP 1: Reverse the direction of the arriving train at Lakeland Jct. so that the trains can proceed north on the Stillwater Industrial Lead.

Details:

1. Arriving at Lakeland Jct., the train stops to allow the head-end conductor to disembark.
2. The train moves east on the Altoona Subdivision until it clears the junction. This requires the bridge over the St. Croix River to be lined for rail movements, because the train must cross the bridge.
3. The head-end conductor disengages the derail on the Stillwater Industrial Lead and lines the switch for the Lead track.

4. The engineer disengages the head-end power, and the helper crew at the rear of the train takes control of the train.
5. The head-end conductor boards the lead locomotive on the helper and the train enters the Stillwater Industrial Lead.

STEP 2: Place the first 52 cars of the train in UP's yard at the plant.

Details:

1. The 114-car train, with helper locomotives leading, proceeds up the Lead and stops short of Marina Crossing, where the head-end conductor disembarks.
2. The train moves forward. As the 53rd car of the train approaches the Marina Crossing, the train stops.
3. The head-end conductor uncouples the first 52 cars from the remainder of the train.
4. The head-end conductor climbs the ladder of the 52nd car, and the helpers continue toward the plant with 52 loaded cars, leaving the rest of the train on the Lead.
5. When the front portion of the train arrives at the south UP Yard switch to the King plant, Point A on Map No. 5, the helper conductor detrains and lines both that switch for the plant lead and the switch leading into Track CNW #1, designated Point B on Map No. 5.
6. The helper conductor reboards the lead helper unit, and it pulls the first 52 cars through Track CNW #1.
7. The train advances to the north end of Track CNW #1, where the conductor disembarks and lines the north Track CNW #1 switch, designated as Point D on Map No. 5.
8. The train continues up to the north UP Yard switch on the Lead track and stops again. This is designated as Point E on Map No. 5.
9. The helper conductor lines the switch for movement onto the Lead track.
10. The train passes through the switch and enters the Lead track north of the UP yard.
11. The helper conductor walks back to the north Track CNW #1 switch, Point D on the map.

12. When the head-end conductor, who has been riding the 52nd car, radios the helper engineer that the train has cleared the south Track CNW #1 switch, Point B on the map, the train stops.
13. The helper conductor separates the train at the clearance point at the north end of Track CNW #1. Track CNW #1 now holds 27 loaded coal cars.
14. The helper locomotives, with 25 cars, pull through the north Track CNW #1 switch, Point D on the map, and stop after clearing the switch.
15. The helper conductor lines the north Track CNW #1 switch for Track CNW #2.
16. The helper locomotive shoves the remaining 25 cars into Track CNW #2. Track CNW #2 now holds 25 cars.
17. The helper conductor boards the locomotives, which exit the UP yard through the north UP Yard switch, Point E on the map.

STEP 3: Remove 62 empty cars from Tracks NSP #3, #4, and #5 and place them on the Stillwater Industrial Lead.

Details:

18. The conductor disembarks and lines the switch for south movement on the Lead track.
19. The helper engineer moves to the south-facing helper locomotive, the helper conductor boards the locomotive, and the locomotives move south on the Lead track to the south UP Yard switch.
20. When the helper locomotives reach the south UP Yard switch, Point A on the map, the helper conductor disembarks and lines the switch for movement on the Lead.
21. Moving south, the helper locomotives pass through the south UP Yard switch and stop.
22. The helper conductor lines the south UP Yard switch for movement toward the NSP yard.
23. Meanwhile, the head-end conductor lines the switches for the NSP Dumper and Tracks NSP #1, NSP #2, NSP #3 and NSP #4, Points F through J on the map, for movement to Track NSP #5.
24. The helper locomotives move north to Track NSP #5.

25. The head-end conductor connects the helper locomotives to the 20 empty cars in Track NSP #5.
26. The helper locomotives pull the 20 cars past the Track NSP #4 switch, Point J on the map, and stop.
27. The helper conductor lines the Track NSP # 4 switch for Track NSP #4.
28. The helper locomotives shove the 20 cars from Track NSP #5 against the 20 empty cars in Track NSP #4, and the head-end conductor makes the connection.
29. The helper locomotives pull the cars out of Track NSP #4 and beyond the Track NSP #3 switch, Point H on the map, where they stop.
30. The helper conductor lines the Track NSP # 3 switch for Track NSP #3.
31. The helper locomotives shove the 40 cars against the 22 empty cars into Track NSP #3, and the head-end conductor makes the connection.
32. The helper locomotives, now pulling 62 empty cars, pull out of Track NSP #3. When the last car reaches the two conductors at the Track NSP #3 switch, they climb on board and ride the train to the south UP Yard switch, Point A on the map.
33. After the 62 empty cars pass through the south UP Yard switch, the helper conductor detrains and the train stops.
34. The helper conductor lines the south UP Yard switch for the Stillwater Industrial Lead.
35. The helper locomotives shove the train north up the Lead track.
36. The head-end conductor, still riding the 62nd car, radios the helper engineer when the rear of the train reaches the north UP Yard switch, Point E on the map, and the train stops.
37. The head-end conductor climbs back onto the 62nd car of the train, and the helper locomotives shove the 62 cars further north up the Lead track. The head-end conductor must continue to ride the 62nd car, because the train crosses an at-grade highway crossing at MP 4.6 of the Lead track.
38. Once the locomotives have cleared the south UP Yard switch, Point A on the map, they stop and uncouple from the 62 empty cars on the Lead track.
39. The head-end conductor walks back to the south UP Yard switch. The helper conductor boards the helper locomotives, and the locomotives move south of the Marina Crossing, where the remaining 62 loaded cars sit.

STEP 4: Place the remaining 62 loaded cars in Tracks NSP #3, #4, and #5 to replace the 62 empty cars.

Details:

40. After passing Marina Crossing, the helper conductor disembarks, and the helper locomotives connect to the remaining 62 loaded cars.
41. The helper engineer moves from the south-facing helper locomotive to the north-facing helper locomotive.
42. The conductor boards the helper locomotives, and they pull the remaining 62 cars and the trailing head-end units to the south UP Yard switch, Point A on the map, where they stop.
43. The helper conductor disembarks and uncouples the helper locomotives from train.
44. The head-end conductor, who walked back from the north end of the empty cars while the remaining loaded cars were brought to the plant, lines the south UP Yard switch for entry into the UP yard.
45. The helper locomotives move through the south UP Yard switch and the south Track CNW #1 switch, point B on the map, into Track CNW #2.
46. The helper conductor connects the helpers to the 25 loaded cars in that track and waits while the head-end power shoves the remaining loaded cars up the Lead track.
47. The head-end conductor lines the switches for Track NSP #5 and the head-end units shove loaded cars into Track NSP #5. The conductor breaks the train, leaving 20 cars in Track NSP #5.
48. The head-end locomotives pull clear of the Track NSP #4 switch, Point J on the map. The head-end conductor lines the Track NSP #4 switch for Track NSP #4.
49. The head-end locomotives shove the remaining 42 loaded cars toward Track NSP #4. The head-end conductor breaks the train, leaving 20 cars in Track NSP #4.
50. The head-end locomotives pull the remaining 22 cars beyond the Track NSP #3 switch, Point I on the map, and the head-end conductor lines the Track NSP #3 switch for movement into Track NSP #3.
51. The head-end locomotives shove the remaining 22 loaded cars into that track.

52. The head-end locomotives disconnect from the cars in Track NSP #3, the head-end conductor boards the head-end locomotives, and the units proceed to the south UP Yard switch, point A on the map.
53. Just beyond the south UP Yard switch, the locomotives stop, and the head-end conductor disembarks and lines the switch for movement on the Lead track.

STEP 5: Remove 52 empty cars from Tracks NSP #1 and #2 and assemble the train of empty cars on the Stillwater Industrial Lead.

Details:

54. The head-end locomotives move north through the south UP Yard switch, Point A on the map, and the head-end conductor connects them to the 62 empty cars that the helper crew placed on the Lead track earlier.
55. The head-end locomotives pull the 62 empty cars south past the south UP Yard switch, Point A on the map, and the head-end conductor lines that switch for movement toward Track CNW #1.
56. The head-end locomotives shove the empty cars past the south UP Yard and the NSP Dumper switches, Points A and F on the map, to the Track NSP #1 switch, Point G on the map.
57. The head-end conductor lines the Track NSP #1 switch for movement toward Track NSP #2, while the helper conductor lines the Track NSP #2 switch, Point H on the map, for movement into that track.
58. The head-end locomotives shove the empty cars into Track NSP #2, where the head-end conductor makes the connection to the 25 empty cars occupying that track.
59. Once the connection is made, the head-end locomotives pull the growing train clear of the Track NSP #1 switch, Point G on the map, and the head-end conductor lines it for Track NSP #1.
60. The head-end locomotives shove the train into Track NSP #1, and the conductor connects it to the 27 empty cars occupying that track.
61. The locomotives pull the cars out of the NSP yard and beyond the south UP Yard switch, Point A on the map.
62. They then shove north on the lead track without blocking any crossings. Once the head-end conductor is satisfied that all of the air hoses have been connected, he walks the length of the train to the head-end locomotives and boards.

63. The train departs the NSP plant, heads for Lakeland Jct., and stops beyond it on the Altoona Subdivision.

STEP 6: Move the 52 loaded cars from the UP yard to NSP Tracks #1 and #2.

Details:

64. After the head-end power and the empty train move south, the helper units pull the 25 loaded cars occupying Track CNW #2 out of that track and beyond the south Track CNW #2 switch, Point B on the map.
65. The helper conductor disembarks and lines the south Track CNW #2 switch, Point C on the map, for the NSP yard.
66. The helper locomotives shove the 25 loaded cars into Track NSP #2.
67. When car closest to the locomotives reaches the clearance point beyond the south Track NSP #2 switch, the train stops and the helper conductor cuts the cars, leaving Track NSP #2 full of loaded cars.
68. The locomotives pull past the south Track NSP #1 switch, Point G on the map, and the helper conductor lines that switch for Track NSP #1.
69. The helper conductor boards the locomotives, and they move south out of the NSP yard. The conductor detrains and lines the switch for Track CNW #1, Point B on the map.
70. The helper locomotives move into Track CNW #1, and the conductor connects the locomotives to the 27 loaded cars on that track.
71. The locomotives pull the loaded cars out of Track CNW #1 beyond the south Track CNW #2 switch, Point C on the map, which the helper conductor lines for Track CNW #2.
72. The helper conductor climbs on the last car, and the helper locomotives shove the loaded cars up to the Track NSP #1 switch, where the conductor disembarks.
73. The helper locomotives shove the remaining loaded cars into Track NSP #1, and the conductor cuts off the cars once they have cleared the switch.
74. The helper conductor boards the locomotives, and they move through the NSP Dumper switch, Point F on the map, and stop.
75. The helper conductor detrains and boards the locomotives, which head back to Lakeland Jct.

STEP 7: Prepare empty train for movement to St. Paul.

Details:

76. Beyond Lakeland Jct. on the Altoona Subdivision, the helper locomotives connect to the 114 empty cars. The lead locomotives, which pulled the train down the Stillwater Industrial Lead, are on the opposite end.
77. The helper conductor detrains, engages the derail on the Stillwater Industrial Lead, and lines the Lakeland Jct. switch for the Altoona Subdivision mainline.
78. The helper crew takes control of the train, performs an initial terminal brake test, and departs for St. Paul. If the arriving loaded train was a BNSF-UP interline train, UP takes the BNSF locomotives back to South St. Paul Yard, where they will wait until NSP unloads the train. If the empty train is a BNSF-UP interline train, UP must ensure that the BNSF locomotives lead the train west toward Minneapolis.

Delivering a Loaded Train When the NSP Yard Is Empty. Sometimes the NSP yard tracks are empty when a loaded train arrives. During the special study period, this happened on one of six trips.

Spotting the loaded cars in the empty NSP yard is, of course, easier than spotting them while removing an empty train. The train crews perform Step 1 and Step 2 as described above. That is, they pass through Lakeland Jct., reverse the direction of the train, and move up the Stillwater Industrial Lead. They stop the train south of Marina Crossing and place the first 52 loaded cars in the UP yard tracks, Tracks CNW #1 and CNW #2. See Map No. 5.

After placing those cars in the UP yard, the helper locomotives return to the second half of the train south of Marina Crossing and connect to it for movement to the plant. This is essential because it avoids the need to shove the remainder of the train, loaded cars first, across Marina Crossing and through the Andersen plant. As described in Step 4 above, the head-end locomotives then place the rear portion of the loaded train into Tracks NSP #3, #4, and #5. After they finish spotting loaded cars in those tracks, the head-end units drift down the Stillwater Industrial Lead to a point south of the Andersen factory and wait.

Finally, the helper crew transfers the cars it had placed in the UP yard tracks to Tracks NSP #1 and #2. Step 6 in our description of the Double Duty provides the details. After finishing their tasks, the helper locomotives move down the Lead track to the head-end units waiting south of the Andersen complex. The helper conductor makes the connection between the helper and head-end units. The four or five locomotives move to Lakeland Jct., where the crews perform the actions described in Step 7, above, and return to St. Paul with the helper units leading the way.

Pulling an Empty Train Without Placing a Loaded Train. UP sent light locomotives from South St. Paul Yard to the King plant to remove an empty train on one of six trips during the special study. UP sends two AC locomotives that can take the train all the way to the PRB. If the train is an interline train originating on BNSF, UP sends the BNSF units that were waiting at South St. Paul Yard. Helper locomotives are not required.

The two locomotives travel light to Lakeland Jct. and pass through the switch. They stop, and the conductor disembarks, aligns the switch for the Stillwater Industrial Lead, and disengages the derail on the Lead. The engineer moves to the trailing locomotive, which now leads, and the locomotives pass through the switch. After the conductor realigns the switch for the mainline, the locomotives travel to the King plant.

Arriving at the plant, the conductor lines switches as needed so that the locomotives can move into Track NSP #5. The locomotives pull empty cars out of Track NSP #5 and then Track NSP #4, as described in Step 3 above. Pulling only the 40 cars from those two tracks, the locomotives move to the Lead track and shove the 40 cars up the Lead beyond the south UP Yard switch, Point A on Map No. 5. The crew pulls only 40 cars because it can shove

them up the lead without crossing any roads. The conductor does not have to protect the rear of the train as the conductor must in the Double Duty.

The train crew then pulls the remaining empty cars from the NSP yard. The conductor first lines the south UP Yard switch for the NSP yard and proceeds toward Track NSP #1. At the Track NSP #1 switch, Point G on the map, the locomotive stops and the conductor climbs down to align the switch for Track NSP #1. The crew pulls the 27 empty cars from that track and then repeats the same steps to reach and pull the 25 cars that occupy Track NSP #2 and the 22 cars that occupy Track NSP #3.

The train pulls out of Track NSP #3 with 74 empty cars. The conductor climbs onto the last car, and the train moves south through the south UP Yard switch, Point A on the map. After the train clears that switch, it stops so that the conductor can get off and line the switch for the Lead track. The train shoves back against the 40 empty cars already on the Lead track, and the conductor makes the connection. The conductor returns to the lead unit, and the train proceeds to Lakeland Jct. with all of the empty cars.

Returning to St. Paul requires extra movements because the train's locomotives are now pointing toward Chicago. When the train returns to Lakeland Jct., it stops, and the conductor disembarks to line the switch to permit movement from the Stillwater Industrial Lead onto the Altoona Subdivision. The conductor reboards the train, which proceeds eastbound across the St. Croix River swing bridge into Wisconsin.

The Altoona Subdivision has two tracks between Hudson (M.P. 18.9) and Sono Jct. (M.P. 23.6), Wisconsin, and this train will need both of them. The train enters the Eastbound Main at Hudson and continues until the entire train is on that track. The conductor disembarks the train and uncouples the locomotives from the train. The conductor hangs the end-of-train

device on the first car, which will soon become the rear car, and then boards the locomotives.

The locomotives proceed more than three miles to Sono Jct., where they pass through the spring switch that marks the end of the double track. The locomotives stop east of the spring switch, and the crew moves to the locomotive on the west end.

When the crew is ready to move west, the locomotives enter the Westbound Main and proceed to Hudson, passing their own train on the Eastbound Main. The locomotives clear the switch at Hudson, and the conductor lines the switch for the Eastbound Main. The locomotives move onto the Eastbound Main and connect to the empty train. After pumping air into the train line and a brake test, the train proceeds to Lakeland Jct., where the conductor gets off of the train and lines the switch for the Altoona Subdivision. The conductor also engages the Stillwater Industrial Lead derail and then boards the lead locomotive. The train heads back to St. Paul.

TWIN CITIES PART IV: Movements to and from the Black Dog Plant

The Black Dog plant is located at Milepost 13.7 on the Mankato Subdivision near Burnsville, Minnesota, approximately 20 rail miles west of South St. Paul Yard. See Map No. 6, UP Routes to Black Dog Plant. St. Paul crews operating from St. James on the Mankato Route deliver trains directly to the plant. After spotting the loaded cars at the plant, these crews take their locomotives to South St. Paul Yard. When the train is emptied, usually two days later, a St. Paul crew takes light engines to the plant and assembles the train for movement toward Wyoming.

Black Dog trains also operate via the Spine Line Route to the vicinity of South St. Paul Yard. These trains may be staged at Mason City. They are also staged at several locations in South St. Paul, usually at South St. Paul Yard or south of the yard. A St. Paul-based crew then

takes the train to the plant and returns with light locomotives, reversing that process after NSP unloads the train.

If the Black Dog plant had a loop track, which would permit highly efficient unloading, UP could avoid moving locomotives back and forth between Black Dog and South St. Paul Yard. Instead, UP locomotives and crews spend considerable time traveling back and forth because NSP requires two days to unload a train.

Whether a train arrives over the Spine Line Route or the Mankato Route, it may arrive when an empty train is already in the plant tracks. When that happens, the UP crew performs a “double duty” at the Black Dog plant by placing the loaded cars in the NSP yard and leaving with an empty train.

Movements between South St. Paul and Black Dog face several obstacles. As UP’s switching study showed, a train crew may spend eight or more hours on a round trip from South St. Paul to the Black Dog plant and back. We will describe the movement of a loaded train or light locomotives from South St. Paul Yard to Black Dog. Empty trains or light locomotives face the same hurdles in the opposite direction.

To reach the Black Dog plant, UP trains must use the Hoffman Avenue Route described above for King plant trains, but only as far as the BNSF/CP joint line. That is, Black Dog movements must travel through Park Junction, across the Hoffman Avenue swing bridge, through Hoffman Avenue Yard, and onto the BNSF/CP joint line.

Unlike King plant trains on the Hoffman Avenue Route, Black Dog trains require both BNSF and CP authority to move from UP tracks onto the joint BNSF/CP line. This is so because trains and locomotives for the Black Dog plant must use not only the BNSF/CP joint line from Hoffman Avenue to Division Street in downtown St. Paul, but also a short segment of

the CP mainline beyond. See Map No. 6, UP Routes to Black Dog Plant. When a UP train approaches the joint line, the crew contacts BNSF's East Hump dispatcher in Ft. Worth. The BNSF dispatcher then contacts the CP's River dispatcher in the Twin Cities. The BNSF dispatcher will not permit the UP train to enter the joint line until it knows that CP dispatcher will accept the train at the other end of the joint line. The BNSF and CP dispatchers must agree to authorize a Black Dog movement to proceed beyond Hoffman Avenue.¹³ Both give priority to their own faster trains.

After using the joint line and short stretch of CP track through downtown St. Paul, UP trains return to UP rails. Approaching Western Avenue Yard, the track is jointly owned by UP and CP, with UP dispatching the track. CP trains, including CP Coal trains for an NSP plant, sometimes block this track. At Western Avenue, the train crew must obtain permission to proceed from UP's Mankato Subdivision dispatcher in Omaha. Movements for the Black Dog plant sometimes wait at Western Avenue while local crews are working ahead of them.

Approximately one mile later, the Black Dog train encounters a second swing bridge across the Mississippi River, Bridge 15. As at the other Mississippi River bridges, trains may wait up to 30 minutes for the bridge to be aligned for train movements. Once across the Bridge 15 at 10 m.p.h., the Black Dog movement finally enjoys 11.3 miles on the Mankato Subdivision with 30 and 40 m.p.h. speed limits and no unusual causes of delay.

Placing and pulling cars at Black Dog is not as complex as at the King plant, but much more complex than at a plant with a loop track. The NSP yard at Black Dog consists of three tracks that connect to the Mankato Subdivision at both ends of the yard. See Map No. 7,

¹³ Eastbound UP crews contact the CP dispatcher, who calls the BNSF dispatcher.

Black Dog Plant and Photograph No. 7. The tracks are numbered 1 through 3, with Track 1 closest to the mainline. Tracks 1 and 3 hold 38 cars each, while Track 2 holds 36 cars. This limits Black Dog trains to 112 cars. Derails protect the mainline from runaway cars.

UP's switching study showed that UP spends an average of 1.48 minutes per car switching the Black Dog plant. Loaded trains can be placed in the Black Dog yard in many ways. The most common and efficient method is as follows:

1. The train arrives at the first mainline switch (either the east switch or the west switch, depending on direction of movement) to the plant yard.
2. The conductor climbs off the locomotive, disengages the derail, and lines the mainline and yard switches for Track 1.
3. The conductor reboards the train, and the train moves through Track 1 to the clearance point of the Track 2 switch at the opposite end of the yard, where the train stops.
4. The conductor disembarks the train, lines the Track 2 switch for Track 1 and the second mainline switch for the yard track, and disengages the other derail.
5. The train pulls through the Track 2 and mainline switches onto the mainline beyond the yard and stops when the 38th car from the rear of the train is at the clearance point on Track 1. The conductor cuts the train at the 38th car, leaving Track 1 full of cars.
6. The conductor sets the requisite number of hand brakes on the cars in Track 1 to prevent runaways.
7. The train pulls beyond the Track 2 switch and the lines the Track 2 and Track 3 switches for Track 3.
8. The engineer shoves the train backward into Track 3 until 38 cars fill Track 3.
9. The conductor disengages those cars, and the engineer pulls the train past the clearance point for Track 2.
10. The conductor sets the requisite number of hand brakes on the cars in Track 3.
11. The conductor lines the Track 3 switch for Track 2 and the engineer shoves the remaining cars into Track 2.
12. The conductor sets the requisite number of hand brakes on the cars filling Track 2.

13. The engineer pulls the locomotives onto the mainline clear of the second mainline switch.
14. The conductor engages the derail and lines the second mainline switch for the mainline.
15. The engineer moves to the controls of the locomotive facing the other direction, and the conductor boards.
16. The light locomotives move back down the mainline to the other end of the yard and stop at the clearance point of the first mainline switch.
17. The conductor disembarks the train and lines the first mainline switch for the mainline, engages the derail at that end of the NSP yard, and pulls the End of Train Device from the last car in Track 1.
18. The conductor boards the lead locomotive, and the crew takes the locomotives to South St. Paul Yard.

Because the Black Dog yard has switches at both ends of each track, a train crew can use essentially the same steps to place coal cars whether the loaded train arrives from the east or the west on the Mankato Subdivision.

Crews typically assemble empty trains as follows:

1. Arriving at the plant with light locomotives, the crew stops beyond the mainline switch at the far end of the yard, and the conductor disembarks. The conductor lines that mainline switch for the yard and the Track 2 switch for Track 1.
2. The conductor also disengages the derail at the far end of the yard.
3. The engineer moves to the other locomotive and backs the locomotives into Track 1. The conductor connects the locomotives to the cars, and the engineer pulls the 38 cars from Track 1 onto the mainline far enough to clear the Track 2 switch.
4. The conductor lines the Track 2 and 3 switches for Track 2, and the engineer shoves the 38-car train against the cars in Track 2. The conductor connects the train to the 36 cars in this track.
5. The engineer pulls the train, now with 74 cars, onto the mainline far enough to clear the Track 3 switch.
6. The conductor lines the switch for Track 3, and the engineer shoves the train back into Track 3. The conductor connects the train to the 38 cars in this track.

7. The engineer pulls the entire train, 112 cars long now, clear of the mainline switch. The conductor re-engages the derail and lines the mainline switch for the mainline. The conductor hangs and activates the End of Train Device on the end of the train.
8. The conductor walks the train, and the engineer pumps air into the train brake system and performs an initial-terminal brake test, a process that requires some 90 minutes.

When a UP crew performs the "Double Duty" at Black Dog, it stops its train on the mainline before reaching the plant. The crew proceeds with the locomotives to the Black Dog yard, where it assembles the empty train, although not quite in the manner described above. With the mainline behind it occupied by the loaded train, the crew assembles the empty train on the mainline ahead of it by transferring each of the three tracks of empty cars separately to the mainline. When the empty train is assembled on the mainline, the train crew connects the air hoses, pumps air into the brake line, and performs an air test. The crew then returns to the loaded train and places the loaded cars in the NSP yard, using the procedure described above. Finally, it retrieves the empty train for further movement.

SEGMENT FIVE: Twin Cities Area to North Platte

Empty NSP trains generally operate via the same route as the loaded trains, except that they normally use the Blair Subdivision from Missouri Valley to Fremont, rather than operating via Council Bluffs. Most King plant trains and some Black Dog trains use the Spine Line Route. Most Black Dog trains use the Mankato Route. Crews operate between the same crew change points as crews on loaded trains.

Specific Traffic and Operating Characteristics of the NSP Movements

In Potomac Electric Power Co. v. Consolidated Rail Corp., ICC Docket

No. 36114 (Sub-No. 1) (ICC served Apr. 7, 1982), the ICC outlined the traffic and operating characteristics necessary to compute the variable costs in a coal rate proceeding. The ICC also

APPENDIX B

Public - Redacted

BEFORE THE
SURFACE TRANSPORTATION BOARD

FMC CORPORATION and	)	
FMC WYOMING CORPORATION,	)	
	)	
Complainants,	)	Docket No. 42022
	)	
v.	)	
	)	
UNION PACIFIC RAILROAD COMPANY,	)	
	)	
	)	
Defendant.	)	
	)	

UNION PACIFIC'S OPENING EVIDENCE

VOLUME 3 OF 10: VARIABLE COST EVIDENCE

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January 15, 1999

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VERIFIED STATEMENT

OF

ROBERT W. LENZER

My name is Robert W. Lenzer. I am Manager-Terminal Operations for Union Pacific Railroad Company in Portland, Oregon. I have worked for UP since 1979, when I hired out as a switchman. In 1981, I became a Yardmaster in Portland, and in 1984 I was appointed Terminal Trainmaster. In 1990, I moved to Baton Rouge, Louisiana, as Manager-Terminal Operations. In order to return to Portland, I became Manager-Yard Operations ("MYO") in 1995. I was promoted to my current position eleven months ago. Altogether, I have worked for UP in the Portland area for about 16 of the last 20 years.

The purpose of this statement is to describe how UP handles export soda ash shipments in the Portland region, and how we return empty covered hoppers toward Wyoming.

Description of Routes and Facilities

Map No. 14 Portland Terminal Area shows UP's routes and yard facilities in the Portland area. It should be a helpful reference for the following description of the facilities and UP's Portland operations.

Principal UP routes radiate in three directions from Portland. The Seattle Subdivision extends north to Longview, Tacoma and Seattle, Washington. From the junction at North Portland, UP operates over BNSF to the Tacoma area. The Portland Subdivision is UP's route east and is the route used for export soda ash and returning empty

cars. A major hump classification yard serving the northwestern region of the railroad is located on this line at Hinkle, 184 miles east of Portland. The former SP Brooklyn Subdivision extends south from Portland to Eugene and northern California.

UP has a complex route network serving the Portland area, and most of the lines are used from time to time to move soda ash. From the east, the Portland Subdivision splits at Troutdale, 16 miles east of Albina Yard, with the Graham Line heading southwest toward downtown then turning north to Albina. Further north, the Kenton Line parallels the Columbia River for 16 miles from Troutdale to Peninsula Jct. then turns south, passing through a mile-long tunnel before arriving at St. Johns Jct. and Albina Yard. Peninsula Jct. is a major intersection for UP. In addition to the Kenton Line extending east and south, the Seattle Subdivision extends north and the St. Johns Branch west about one mile to the east end of Barnes Yard. Passing through Barnes, this branch loops west to the port area along the east bank of the Willamette River and then south to St. Johns Jct. near Albina. The Branch is about six miles long.

Barnes Yard is located about five miles northwest of Albina and is a major industrial yard serving the port area. The yard has 22 tracks, and about 70 yard engine shifts per week are based there. The mainline runs through the middle of the yard and the tracks on the north and south sides of the mainline are called the "short" and "long" yards respectively. The short yard has seven tracks and the long yard has 15 tracks. The "short" and "long" designations are indicative of the length of the individual tracks in each yard. The yard is constrained by a grade crossing at the east end, the Barnes Auto Ramp facility on the north side, light industries on the south side, and an industry lead that breaks off the St.

Johns Branch and extends northwest to Terminal 5, also known as South Rivergate.

Because of this configuration, trains coming and going to South Rivergate restrict the movements of yard jobs working the west end of the yard.

Barnes Yard has no car repair or locomotive servicing facilities. All defective cars are moved to Albina Yard for repair. Barnes Yard on occasion becomes gridlocked. This is attributable to the relatively small size of the yard in relation to the traffic volume passing through and the number customers served.

Map No. 15 Terminal 4 and Barnes Yard is a schematic diagram of the Barnes area. Terminal 4, where soda ash is unloaded, is located on the St. Johns Branch about one mile southwest of Barnes Yard. In addition to the "Soda Dome," where soda ash is stored for export, and Hall-Buck Marine's soda ash rail-ship transload facilities,¹ Terminal 4 has several other major customers. There are two running tracks between Barnes Yard and the entrance to Terminal 4. The Terminal 4 Lead to the north end of Terminal 4, which is used by soda ash traffic to Hall-Buck, has a steep grade dropping down to the wharf facilities. The two St. Johns Branch running tracks south of where the Terminal 4 Lead breaks off are often used to store soda ash and grain cars awaiting placement at Terminal 4. When the St. Johns Branch is blocked with cars, branchline moves can detour via the Terminal 4 Yard, as shown on the map.

Movement of Soda Ash to Terminal 4

Because of the limited facilities at the Hall-Buck facility at Terminal 4 and its

¹ Hall-Buck Marine recently sold its facilities to Kinder Morgan Bulk Terminal, but I will use the term "Hall-Buck," as we do in Portland.

frequent inability to accept trains on arrival, UP cannot operate true unit trains to the port facility. It must break up soda ash trains and reassemble empty cars into trains for movement east. This greatly increases UP's work, as described below.

1. Operation of soda ash trains to Portland: Normal movement

Export soda ash generally moves from the producing area west of Green River, Wyoming, to Portland in solid trains, typically 90 to 110 cars long. The last road crew on an inbound soda ash train, which normally goes on duty at Hinkle, usually requires 8 to 10 hours to reach Barnes Yard, where its run terminates. If the locomotive needs servicing or repairs, the crew will take the power to Albina Yard; normally a UP crew van takes the crew to Albina, where it goes off duty.

Although soda ash trains normally use the direct Kenton Line to Barnes Yard, they sometimes use an alternative route over the Graham Line. When the Kenton Line is congested, some trains operate over the Graham Line to Albina Yard, then north up the Kenton Line to Peninsula Jct., and then west to Barnes Yard.

Under ideal conditions, the road crew delivers the train to Barnes Yard and places its cars in yard tracks. No track at Barnes is long enough to hold a typical unit train without blocking a lead track. Yarding the train at Barnes requires roughly 30 to 90 minutes, depending on the availability of tracks, traffic interference, and the number of tracks that must be used. Sometimes the road crew has insufficient time under the Hours-of-Service law to reach and yard a train at Barnes. If the train makes it to Barnes shortly before the road crew runs out of time, a yard crew finishes yarding the train. If the train reaches the Portland terminal area, west of the east switch at Sandy (about 2 miles east of

Troutdale), a yard crew is called to go get the train. If the train does not reach the Portland terminal area, an additional road crew is called.

2. Staging trains

UP usually takes trains to Barnes Yard, but it is often required to “stage” or hold soda ash trains at various places en route. When exports are at normal levels, up to one-third of the trains must be staged for Portland because Barnes Yard lacks capacity due to back ups and delays at Hall-Buck.

There are many reasons for Hall-Buck's inability to take soda ash when the train approaches Portland. Hall-Buck loads soda ash on ships that arrive from all over the world. The ships are not evenly spaced. When there is a gap between ships, the Soda Dome is loaded to capacity and there is no place to put more soda ash. In addition, the Soda Dome has about 50 carloads of soda ash inside that cannot be removed because it has solidified. The Dome has less fluid capacity and fills faster than expected.

The problem is worse in the winter when ships are delayed due to rough seas in the North Pacific. This causes ships to become even more bunched than they otherwise would and leaves longer periods when soda ash cannot be loaded into ships. Similar problems arise when a ship is rejected for loading because it is not sufficiently clean, which happens from time to time. Many ship captains will not load soda ash during rain, because the soda ash will harden in their holds. In Portland's rainy climate, that produces many delays.

UP also must stage trains when the Soda Dome closes because of mechanical problems. This happens more often than expected, as the Dome is not as reliable as desired.

The Dome suffers from ground water problems. Hall-Buck constantly pumps water out of the bottom of the Dome. Thus, when the water table gets too high, the Dome cannot be used. The Dome also is unusable when mechanical problems affect the conveyor equipment that moves the soda ash from the Dome to the ship. During these periods, Hall-Buck must unload directly from rail cars, which is slower and causes delays on UP in placing cars at the facility.

Hall-Buck is also unable to accept trains when it is handling other products. Occasionally, Hall-Buck loads a ship loaded with another bulk product. When this happens, UP must stage soda ash en route. Finally, UP sometimes must stage trains when the grade of soda ash in the train does not meet the requirements for the next ship.

UP holds up to two soda ash trains in the vicinity of Barnes Yard, plus a third train on the Kenton Line, usually at Kenton, to ensure that there is adequate product on hand to load ships as quickly as possible. One trainload of cars can be held on the St. Johns Branch main adjacent to Terminal 4, and a second train can be doubled onto two or three tracks at Barnes Yard. When Barnes Yard cannot accept a train, it is most often staged at Kenton on the Kenton Line. Since the longest track at Kenton can only hold about 75 cars, it is necessary to divide a soda ash train into two tracks, a task performed by the road crew if it has time, or a yard crew. Occasionally it is necessary to hold a train at Champ. Although it is not necessary to split a train at Champ, using the only long siding on the Kenton Line to store a soda ash train is undesirable because it blocks the siding, results in a loss of capacity on this busy route and delays other trains.

When track on the Kenton Line in the Portland area is unavailable to stage trains, UP is forced to stage soda ash trains on its mainline between Hinkle and Portland or even further east. UP generally does this at sidings west of Hinkle. When UP stages trains, it must use extra road crews to get the trains to Barnes. One crew takes the train from Hinkle to the staging location, where a crew van picks the crew up and takes it to Portland. Then another crew is taken by van to retrieve the train when there is room for the train in the Portland terminal area. There have been times when UP has been forced to stage soda ash trains as far east as Wyoming.

Sometimes UP must stage soda ash trains because of congestion caused by too much traffic at Barnes Yard. This happens, for example, when the yard is full of export grain cars.

3. Movement of loads from Barnes Yard to Terminal 4

Planning for the daily handling of export soda ash in Portland begins with the mid-afternoon arrival of Hall-Buck's "M/V Loading Schedule/Railcar Movement" bulletin via facsimile at the MYO office at Albina and the Barnes Yard office. This bulletin details the ships scheduled to load at Terminal 4 for the next seven days, including scheduled arrival and departure dates and times, and the number of carloads to be loaded on each ship. The bulletin details which trains need to be spotted for transloading to the ships loading during the next three or four days, and it may indicate how many carload equivalents will be sourced from the Soda Dome. Based on this information and additional phone calls with Hall-Buck, the MYO and Barnes yardmasters plan the switching for Hall-Buck Marine about 24 hours in advance.

UP yard jobs YBA56, YBA66 and YBA76 primarily handle the soda ash loads between Barnes Yard and Terminal 4 and return with the empties to Barnes Yard. Other assignments may perform this work as needed. Job YBA56 goes on duty at 7:59 a.m. daily. Job YBA66 starts its work at 3:59 p.m. daily. Job YBA76 goes to work at 11:59 p.m. Sunday through Thursday. All yard jobs use three-man crews. At various times in the past, extra yard crews have been called, especially to spot the terminal on third shift Saturday night.

When spotting Terminal 4, the UP yard crew pushes the loads from Barnes Yard downward toward the river. The steep grade leading from Barnes down to Terminal 4 dictates that air brakes be used on all cars to insure adequate braking. Because of the grades and the backup move from Barnes to Terminal 4, each movement is usually about one-third of a train. Thus, two or three transfer moves are required to deliver an entire train to Terminal 4. Two locomotive units normally are used on cuts greater than 25 loads because of the descending grade and reverse curves west of Barnes Yard. Generally 1,500-hp switch locomotives are assigned to Barnes, but occasionally larger road units are used. The engineer must know when enough cars in his cut are over the "hump" at MP 5.1 on the St. Johns Branch to begin cutting back on power and applying the air brakes. Roughly two to three hours are required to make a transfer run to deliver one cut of loads to Hall-Buck and return to Barnes with empties. Additional time is often required because of waiting for permission to enter the Hall-Buck facility, interference from other switching, and bad weather.

A derail prevents UP from entering the facility while Hall-Buck's switch engine is moving cars, and only a Hall-Buck employee can unlock the derail. Safety dictates that Hall-Buck shut down most of its switching when the derail is unlocked, allowing a UP crew to enter the facility and switch. Although Hall-Buck tries to coordinate with the Barnes Yardmaster when UP will switch their facility, the UP crew must often wait 15 to 30 minutes upon arrival at the derail before Hall-Buck unlocks the derail. Once the loads are spotted on the unloading tracks, Hall-Buck takes over, using its locomotive to pull the cars through the unloading shed and the ship-loading tracks and to shove the empties into the two empty-car tracks in five-to seven-car cuts.

The Soda Dome

ANSAC and the Port of Portland, with UP's assistance, constructed the Soda Dome and placed it in service in August 1995 to store about 350 carloads of soda ash. This rectangular structure is located just north of the rail car unloading facility and is operated by Hall-Buck. The Dome was built to improve rail car and ship turn-around times. In theory, trains would no longer have to wait for the arrival of a ship to unload, and ships would not have to wait for the arrival of trains. If no ship is on hand for loading, cars could be unloaded and the soda ash conveyed into the dome. Ships could be loaded either from cars or the Dome, or both simultaneously.

The anticipated benefits of the Dome have not been fully realized, as I have explained, because the Dome suffers structural problems. The Dome was constructed without a diaphragm underneath, allowing ground water to leak into the building. Water is pumped out continuously, along with subsoil in solution. As a result, the building is settling

unevenly, causing various items of equipment to become misaligned. The problems are worse when the Willamette River, about 100 yards west, reaches high levels, as it does during most years. The life expectancy of the Dome is shorter than expected.

Wet soda ash turns to stone when it dries. Hall-Buck has used jack hammers and even dynamite to dislodge product in the Dome. Soda ash also clings to the sides of the Dome because the angle of repose of the Dome's sides is too shallow. The end result of these problems is that the Dome has an effective load-out capacity of about 300 cars instead of 350 carloads. Also, mechanical problems with the Dome product handling systems cause more product to be transloaded directly from rail cars to ships than was planned. These problems force UP to stage more soda ash trains than anticipated, and much of the projected reduction in car cycle times and staging of trains anticipated from construction of the Dome has not been realized.

Movement of Empty Cars from Terminal 4 to Hinkle

Given the way the loaded export trains must be split up to fit into Barnes Yard or the Kenton line and then again to be spotted at Terminal 4, plus the additional cuts into groups of five to seven cars made by Hall-Buck during the unloading process, the empties are returned to UP mixed by soda ash producer. UP needs to receive them in Wyoming blocked for producers to prevent the cars from having to be classified at Green River Yard, which is already heavily used. Although UP pays Hall-Buck a switch fee to block the empty soda ash cars, this blocking is not being done. As a result, UP must classify empty soda ash cars at Barnes Yard.

At Terminal 4, the UP crew combines the empties from the two empty-car tracks and pulls them back to Barnes Yard, where UP classifies them into blocks for delivery to Wyoming producers or Green River. Once they are classified, the blocks are placed on Tracks 1 and 2 at Barnes Yard for outbound inspection and an air test. These two tracks, each with a capacity of 50 to 55 cars, are equipped with yard air and roadways for use by carmen. Other tracks may also be used.

Because of the way the empties dribble back to Barnes from Terminal 4, the lengths of the empty trains vary much more than the lengths of the loaded trains. Empty trains may range up to 130 cars. An 8,000-ft. train length limit between Portland and Granger sets this upper limit on the number of cars. Barnes can also build and work a full train on Track 22, but only if the train can move promptly, because a long unit train blocks the lead to the auto facility and part of the east switching lead. When carmen give the cars an initial terminal inspection, roughly two percent of the cars are typically bad-ordered. Those cars must be transferred to Albina Yard for repairs.

Usually, a crew van transports the road crew from its on-duty location at Albina Yard to Barnes Yard. At other times, the road crew picks up its locomotives at Albina Yard and moves them to Barnes. This causes initial terminal delay, because final air tests cannot be done until the power arrives. The road crew then takes the train, designated as OBRGR, from Barnes to Hinkle. A few empty cars, including those repaired at Albina, return to Wyoming on manifest trains.

APPENDIX C

Highly Confidential Material Redacted