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BEFORE THE
SURFACE TRANSPORTATION BOARD

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

REVIEW OF THE GENERAL PURPOSE COSTING SYSTEM

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# COMMENTS OF
# ARKANSAS ELECTRIC COOPERATIVE CORPORATION


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Dated: June 20, 2013

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COMMENTS OF
ARKANSAS ELECTRIC COOPERATIVE CORPORATION

In accordance with the Board's decision served February 4, 2013 in this docket, Arkansas Electric Cooperative Corporation (AECC) 1/ submits these comments regarding changes the Board has proposed to the Uniform Railroad Costing System (URCS).

AECC commends the Board for seeking to address the need to improve URCS "to better reflect railroad operations and to automatically reflect economies of scale as shipment size increases." 2/ However, the Board's proposals introduce identifiable inaccuracies, and do

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1/ AECC is a membership-based generation and transmission cooperative that provides wholesale electric power to electric cooperatives, which in turn serve over 500,000 customers, or members, located in each of the 75 counties in Arkansas and in surrounding states. In order to serve its 17 member distribution cooperatives, AECC has entered into arrangements with other utilities within the state to share generation and transmission facilities. For example, AECC holds ownership interests in the White Bluff plant at Redfield, AR and the Independence plant at Newark, AR, each of which typically uses in excess of 6 million tons of Powder River Basin (PRB) coal each year. In addition, AECC holds ownership interests in the Flint Creek plant at Gentry, AR and the Turk plant at Fulton, AR, each of which typically uses on the order of 2 million tons of PRB coal each year. Because of the large volume of coal consumed by these plants, the rail captivity of three of these plants, and the prominent role of variable costs (as determined by URCS) in determining the regulatory protections available to captive shippers, AECC has a direct interest in the URCS methodology and its accuracy in reflecting the efficiencies of unit coal train movements.

2/ February 4 Decision at page 4.

not capture the full efficiencies and savings associated with current unit train operations. In these comments AECC identifies and describes modifications of the Board's proposals and other changes to URCS that would enhance the accuracy of variable cost estimates provided by URCS.

## Introduction and Summary of Comments

In its February 4 Decision, the Board proposed a series of changes to URCS, some of which affect the methods used to identify and reflect the savings associated with unit train traffic. The costing of unit train traffic is important to AECC and other coal shippers for reasons that the Board articulated in its report to Congress:

> *First*, there has been no significant review of URCS since it was adopted by the Board's predecessor, the Interstate Commerce Commission (ICC), in 1989. URCS should be updated periodically to ensure that it remains reliable.
>
> *Second*, the Board has increased its reliance on URCS. In the past 5 years, the Board has adopted a number of changes to its rate case methodologies that give URCS a more prominent role in determining whether a rate is reasonable and what relief a rail shipper should receive. The increased reliance on URCS costs should be accompanied by increased vigilance with regard to continued accuracy. 3/

As described by the Board, URCS historically has reflected the efficiencies of unit-train operations through "5 . . . adjustments that are applied to trainload (50 car or more) movements":

> (1) origin and destination switching costs are reduced by 75%;
>
> (2) interchange costs are reduced by 50%;

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3/ Surface Transportation Board Report to Congress Regarding the Uniform Rail Costing System, submitted pursuant to Transportation and Housing and Urban Development, and Related Agencies Appropriations Bill, S. Rep. No. 111-69 (May 27, 2010) ("STB URCS Report to Congress") at Executive Summary, page i.

(3) inter- and intra-train switching costs are eliminated;

(4) no way train costs are used; and

(5) station clerical costs are reduced by 25% for each car. 4/

The Board's new proposals focus largely on modifying these adjustments to address discontinuities that they produce, 5/ and on replacing the so-called "make whole" adjustment (used to amend the costing of other traffic types to account for unit train cost savings) with a method intended to better reflect scale economies.

Econometric studies have confirmed that unit trains achieve very substantial efficiencies compared to way/through trains, 6/ but these efficiencies are not adequately captured by the current URCS methodology. This shortcoming of URCS is demonstrated by the very substantial difference between URCS results based on the current unit train adjustments and URCS results for analogous traffic where detailed "movement-specific" adjustments have

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4/ See STB Docket No. EP 431 (Sub-No. 2), Review of the General Purpose Costing System, decision served October 1, 1997 at page 4, footnote 15.

5/ Discontinuities in URCS costs formed a central issue in Docket No. NOR 42124, State of Montana v. BNSF Railway Company, wherein the Board found that a BNSF "tariff modification was structured in a specific attempt to exploit a loophole in the Board's Uniform Railroad Costing System (URCS) by trying to lower the revenue-to-variable cost (R/VC) ratios of 52-car shipments, thereby increasing the likelihood that such shipments would not be subject to regulatory challenge. We do not condone such conduct, and advise parties that if a shipper were to submit a request for 52-car service, any attendant denial . . . shall be deemed unreasonable if such denial is premised on a rationale related to URCS costing matters." See decision served April 26, 2013 at pages 1-2.

6/ See, for example, Bitzan, John D. and Wesley W. Wilson, "A Hedonic Cost Function Approach to Estimating Railroad Costs", as published in Dennis, Scott M. and Wayne K. Talley eds., Railroad Economics (Research in Transportation Economics, Volume 20) (2007) at page 83. Professor Wilson has served as a consultant to the Board on URCS. (See STB URCS Report to Congress at page 12, footnote 44.)

been permitted; AECC has previously documented this fact. 7/ The existing URCS unit train adjustments do not fully reflect the substantial observed differences between costs for unit trains and costs for other traffic, and therefore do not adequately capture unit train cost savings.

Three changes in the railroad industry over recent years have made it increasingly important for URCS to measure the costs of unit trains with greater accuracy. First, the volume of traffic potentially affected by the costing of unit train movements has become extremely large. Unit train traffic has grown from a negligible base in the early 1960's to a point where it now accounts for approximately 42% of all of the gross ton-miles of railcars and cargo moved by the Class I railroads. 8/ Second, cost reductions and the growth of traffic and contribution over time have moved the railroads to a position of achieving or exceeding revenue adequacy, 9/ even under the Board's system of determining revenue adequacy, which itself has lagged behind the "real world" determination of whether a company's earnings are

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7/ STB Ex Parte No. 681, Class I Railroad Accounting and Financial Reporting - Transportation of Hazardous Materials, Comments of Arkansas Electric Cooperative Corporation on Proposed Rule-Making (February 4, 2009) at 8-10.

8/ See Table 3, attached.

9/ Notwithstanding the possible overstatement of the cost-of-capital embedded in the Board's current estimates (see footnote 10), even those estimates indicate that, as of 2011, the four Class I mega-systems as a group achieved revenue adequacy. As shown in Docket No. EP 552 (Sub-No. 16), Railroad Revenue Adequacy- 2011 Determination, Decision served October 16, 2012, Appendix B, the sum of "Adjusted Net Railway Operating Income" for BNSF, CSX, NS and UP is $10,747,058; the sum of "Tax Adjusted Net Investment Base" for those 4 carriers is $92,513,568; and the consolidated "Tax Adjusted Return on Investment" for those 4 carriers is 11.62%. In EP 558 (Sub-No. 15), Railroad Cost of Capital-2011, Decision served September 13, 2012, the Board determined that the 2011 railroad industry cost of capital was 11.57%.

sufficient to attract investors. 10/ Third, under the traffic and contribution levels that have materialized, the Board's major rate case procedures routinely are unable, due to the jurisdictional threshold, to limit differential pricing sufficiently to prevent cross-subsidy and supracompetitive earnings (as determined by the SAC test). 11/

Because URCS is failing to reflect fully the true efficiencies associated with modern unit train operations, the protections that the SAC test and the jurisdictional threshold were intended to provide against cross-subsidy and resource misallocation are becoming increasingly ineffective. This failure in URCS is detrimental not only for shippers, but also for the economy as a whole. It therefore is essential that the Board use this opportunity to take meaningful steps to ensure that URCS accounts reasonably and properly for the full cost savings associated with unit train traffic. 12/

Toward that end, these comments begin with an examination of the proposals advanced by the Board. We identify logical and numerical inconsistencies in the proposed

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10/ See, for example, Docket No. EP 711, Petition for Rulemaking to Adopt Revised Competitive Switching Rules, Responsive Comments of Arkansas Electric Cooperative Corporation (May 30, 2013) at 3-5. See also Docket No. FD 35506, Western Coal Traffic League - Petition for Declaratory Order, Opening Evidence and Argument of Consumers United for Rail Equity (October 28, 2011) at 10-15.

11/ In the WPL/Edgewater rate case, the stand-alone cost (SAC) for the railroad designed by the shipper was found by the Board to be lower than the 180 percent R/VC jurisdictional threshold. See Docket No. NOR 42051. Wisconsin Power and Light Company v. Union Pacific Railroad Company, Decisions served Sept 13,2001 and May 14,2002. Stipulations to that effect were entered by the parties in the more recent KCPL/Montrose (Docket No. NOR 42095) and OGE/Muskogee (Docket No. NOR 42111) proceedings.

12/ Although there may be opportunities in the future to improve or even replace URCS via fundamental methodological changes, as the Board described in Parts III.B, III.C, and IV of STB URCS Report to Congress, such possibilities should not prevent the Board from now making feasible corrections needed to more accurately reflect unit train costs.

treatment of switching costs, and in the Board's proposed change in the definition of a trainload. The problems in both of these areas could be remedied by distinguishing shipments based on the method in which they actually are handled (trainload vs. nontrainload) rather than continuing to rely on an assumed demarcation based on the number of cars.

These comments also examine a series of issues for which meaningful changes in URCS procedures are warranted for a combination of theoretical and empirical reasons. These issues pertain to the estimation of variable costs associated with:

- Train and engine crews;
- Use of private cars;
- Fuel;
- Road property depreciation; and,
- Return on road property investment.

Specific issues within these areas are identified and discussed below, and proposed refinements are developed and presented.

Review of Board's Proposed Changes

The Board "evaluated the three categories of costs for which efficiency adjustments are made to determine what changes would be needed in order to adjust the calculation of system-average unit costs in Phase II." 13/ Two of these categories relate to costs experienced during switching, including switching costs related to switch engine minutes, which the Board proposes to treat as "per shipment" costs. The Board also proposes to increase to 80

13/ February 4 Decision at page 4.

cars the threshold requirement for a shipment to be treated by URCS as a trainload. Each of these proposed changes is addressed below.

Switching Costs

For nontrainload shipments, the Board's proposal to convert costs related to switch engine minutes to a per-shipment basis appears to reflect reasonably well how switching costs are incurred; switching activities (and costs) for individual shipments moved in manifest trains are likely to be relatively insensitive to the number of cars in the shipment. However, extending this approach to trainload shipments would create substantial inaccuracy in reflecting switching costs for such shipments.

The Board's proposal would have the numerical effect of eliminating the discontinuity between trainload and nontrainload shipments, as the Board has intended, because the fixed per shipment cost would simply be spread over larger numbers of cars as shipment sizes increase. But eliminating the discontinuity produces a clear inaccuracy, because a substantial discontinuity properly *should* exist between shipments that are moved in trainload vs. nontrainload quantities. One of the major efficiency benefits of shipments made in trainload quantities is the avoidance of the costs associated with making up and breaking down manifest trains. This benefit is recognized by shippers and railroads alike. 14/ The existence of a substantial discontinuity between trainload and nontrainload shipments in switching and way train costs reflects the benefits of unit train service. This is why costs associated with most

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14/ Unit trains are efficient because ". . . switching of rail cars in intermediate yards is eliminated". http://www.texascrushedstoneco.com/unit-trains/ . "(S)uch trains cut costs by eliminating intermediate yarding and switching." http://www.uprr.com/customers/chemical/crude/equipment.shtml.

origin and destination switching and all inter-train & intra-train (I&I) switching and way train activities are excluded from unit train costs under the Board's current methodology. This exclusion provides a valid depiction of the realities of unit train economics, which should not be lost in the interest of "smoothing away".

The Board's proposal to convert switching costs to a per shipment basis appears to be reasonable for nontrainload traffic, but for trainload traffic it should not take the place of the exclusion of costs that in fact are not incurred.

Definition of Trainload

The Board proposes to require that an individual shipment contain 80 or more cars before it is considered to be a trainload. This represents a large increase relative to the current practice of defining a trainload as a shipment of 50 or more cars.

The Board acknowledges that this proposed change would increase the distribution of costs to unit train traffic, 15/ so it would not contribute to reducing the "gap" that exists between actual trainload savings and the trainload savings currently shown by URCS. Even so, the proposed change arguably would be appropriate if there were evidence that shipments of fewer than 80 cars normally would be combined with other shipments rather than moved separately.

However, there is abundant evidence that shipments of fewer than 80 cars are not combined with other shipments, so the proposed 80-car standard does not reflect real-world operating practices. Across the rail industry, data regularly published by AAR suggest an average overall train length – including trainload and unit train traffic - of approximately 56 cars

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15/ February 4 Decision at pages 9-10, footnote 13.

in 2011. 16/ Similarly, data already in the Board's possession show an average train length of approximately 54.4 cars for non-unit, through train traffic moved by BNSF, CSX and NS:

Table 1

"Big 4" Average Through Train Lengths

| Railroad | Car Miles-Through Trains[17] | Through Train Miles[18] | Cars Per Through Train |
|---|---|---|---|
| | (1) | (2) | (1)/(2) |
| BNSF | 4828145 | 95142 | 50.7 |
| CSX | 3039401 | 51711 | 58.8 |
| NS | 2904403 | 51341 | 56.6 |
| Subtotal Non-UP | 10771949 | 198194 | 54.4 |
| UP | 7726715 | 90768 | 85.2 |
| Total | 18498664 | 288962 | 64.0 |

In this context, the 85.2 car average through train length estimate for UP is clearly an outlier, and is not reflective of railroad industry practices generally. Aside from UP, none of the "Big 4" Class I railroads has an average through train length over 58.8 cars, with BNSF (50.7 cars) barely exceeding the Board's current 50-car standard.

If railroads in practice consolidate smaller shipments to yield through trains of a given average length, there is no rational foundation upon which the Board reliably could conclude that individual shipments greater than that length would nevertheless be held for further consolidation. If anything, the cost savings associated with trainload movements should

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16/ See AAR, Class I Railroad Statistics (February 7, 2013), page 2, as presented at https://www.aar.org/StatisticsAndPublications/Documents/AAR-Stats-2013-02-07.pdf . Computed as (Average Tons Per Train/Average Tons Per Carload) = (3538/62.9) = 56.2 carloads/train.

17/ Source: 2011 URCS Worktable A1 Part 1, Line 117 Column 1.

18/ Source: 2011 URCS Worktable A1 Part 1, Line 103 Column 1.

cause a railroad to prefer to handle as a trainload shipments that are somewhat smaller than the average through train. This is substantiated by the description of unit train operations provided by a major aggregates shipper, which states that the normal range of unit train lengths includes shipments involving as few as 40 cars, and that only shipments of less than 40 cars move in manifest service. 19/

Overall, there is abundant evidence that, across the industry, train lengths are nowhere near a level that would support the Board's proposed 80-car standard for defining trainload service, and that even the current 50-car standard mischaracterizes significant volumes of known unit train traffic as carload shipments. There is no basis for any increase from the 50-car standard.

AECC's Proposed Alternative

To address both the train length issue and the discontinuity issue discussed above, the Board should amend URCS procedures and underlying data collection requirements as needed to enable shipments made in nontrainload quantities to be distinguished from shipments made in trainload/unit train quantities on the basis of the way the shipments actually are handled, rather than any assumed demarcation based on numbers of cars. This would facilitate the development of accurate unit costs for each type of shipment, eliminate the need for the "make-whole" adjustment, and leave in place an appropriate discontinuity between trainload and nontrainload shipments, while avoiding discontinuities and properly reflecting scale economies within each shipment type. For example, a unit cost for inter- and intra-train (I&I) switching per shipment would be developed based on the number of shipments

19/ See http://www.texascrushedstoneco.com/unit-trains/.

moved in nontrainload service (i.e., that actually receive I&I switching); for shipments moved in trainload service the corresponding unit cost would be 0. Even with cost components for which unit trains produce only partial savings, information regarding the quantity of traffic moved via unit trains vs. way/through trains can be used to "decompose" the overall average unit cost into separate unit costs for the two movement types. 20/ Movement costing then would be based on the method in which the shipment is/would be handled, using the corresponding unit cost factors. 21/

## Additional URCS Changes Recommended By AECC

### Train and Engine Crews

Following the reasoning articulated by the Board for switching costs, train and engine crew (T&E) costs for shipments moved in trainload/unit train service should not vary

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20/ The total of any variable cost is the sum of the products of the unit cost for each train type and the volume to which it applies:

$$\text{Variable cost} = \text{Unit Cost}_{\text{manifest}} \times \text{Volume}_{\text{manifest}} + \text{Unit Cost}_{\text{unit train}} \times \text{Volume}_{\text{unit train}}.$$

As long as the relationship between the unit costs is known (or assumed), and the relative volumes of each type of traffic are known, each unit cost can be computed directly. For example, if unit trains comprise 25 percent of traffic and avoid 50 percent of a given type of cost:

$$\text{Variable cost} = \text{Unit Cost}_{\text{manifest}} \times \text{Volume}_{\text{manifest}} + 0.5\ \text{Unit Cost}_{\text{manifest}} \times (0.25/0.75)\ \text{Volume}_{\text{manifest}}$$

$$\text{Variable cost} = 1.167\ \text{Unit Cost}_{\text{manifest}} \times \text{Volume}_{\text{manifest}}, \text{ and:}$$

$$0.857 \times \text{Variable Cost}/\ \text{Volume}_{\text{manifest}} = \text{Unit Cost}_{\text{manifest}};\ 0.429 \times \text{Variable Cost}/\ \text{Volume}_{\text{manifest}} = \text{Unit Cost}_{\text{unit train}}$$

To illustrate, if total variable cost is 1000 and the volume of manifest traffic is 75, the unit cost for manifest traffic is ((0.857x1000)/75=) $11.43 and the unit cost for unit train traffic is $5.71. As a check: $11.43 x 75 + $5.71 x 25 = 1000.

21/ This would eliminate the discontinuity issues that arose in Docket No. NOR 42124.

with the number of cars in the shipment. A shipment moved as a trainload/unit train has basically the same crew requirements irrespective of the number of cars it contains. T&E costs for trainload shipments should therefore be treated as a per shipment cost for a trainload/unit train movement of a given duration/distance.

Private Cars

The Board in 2011 implemented a change in the way URCS ascribes costs to movements in private cars. Specifically, the Board ". . . substituted regional rental unit cost per car-mile for individual railroad rental cost per car-mile [values] that are negative or zero . . . ." 22/ While this is represented as having been applied to a limited number of specific cells, it corresponds to broad observed increases in Board-computed unit cost levels for use of private cars. For example, in URCS Worktable E1 Part 2, the unit cost for use of private gondolas for the entire western region reported in Line 204, Column 13, increased by over 38 percent from 2010 to 2011 (while the analogous unit cost for rail-owned gondolas reported in Line 204, Column 5, increased by only 7 percent). Likewise, the unit cost for use of private hopper cars for the entire western region reported in Line 208, Column 13, nearly quadrupled from 2010 to 2011.

Irrespective of other factors that may have contributed to such observed unit cost increases, it is troubling that the Board would accept accounting reports containing missing or invalid entries for any data items required for costing purposes. It is even more troubling that, having been provided a value of zero for an accounting entry, the Board for costing

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22/ 2011 Uniform Railroad Costing System, "Phase III Data Substitutions" (October 24, 2012) at page 2.

purposes would overwrite that value with a non-zero entry that had no compensating offset elsewhere. The net effect of such a practice is to produce cost estimates that are inconsistent with, and overstated relative to, the accounting data on which they ostensibly are based. The Board should enforce reporting requirements for all data needed for costing purposes, and, absent a compelling justification, should avoid making assumptions that implicitly or explicitly alter data it has received.

More generally, the Board should ensure that URCS produces accurate results in circumstances where specific cost components are not relevant or applicable to a particular movement. 23/ For example, in Docket No. FD 35504, the Board denied a railroad petition for a declaratory order regarding tariff provisions that would require shippers of toxic-by-inhalation (TIH) hazardous commodities to indemnify railroads against all liabilities other than those resulting from the railroads' own negligence or fault. This leaves substantial TIH-specific costs and cost-exposure with the railroads that URCS should not cross-subsidize from non-TIH commodities. 24/

Section 10707(d)(1)(B) on its face imposes no requirement that URCS apply a system average value for all cost components to all movements, and explicitly reserves to the Board the power to adopt an alternative methodology and/or to specify allowed adjustments. In furtherance of the explicit goals of the rail transportation policy "to ensure the availability of

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23/ The Board's own manual for URCS recognizes that some types of costs should be excluded from the costing of individual movements "unless directly specified by the user". STB, "Railroad Cost Program" (December 2011) at page 10.

24/ The Board has indicated that even the most basic option for upgrading URCS would involve further consideration of TIH costs. See STB URCS Report to Congress at page 19.

accurate cost information in regulatory proceedings" (Section 10101(13)), "to foster sound economic conditions in transportation" (Section 10101(5)), "to encourage honest and efficient management of railroads" (Section 10101(9)), and "to require fair . . . regulatory decisions when regulation is required" (Section 10101(2)), the Board should ensure that costs or cost components not relevant or applicable to a particular movement are not included in its URCS costs.

Fuel

According to the Board's URCS Workpapers, in the western region where AECC's coal traffic moves, fuel is treated as 96 percent variable. 25/ This measurement results from the application of a regression model in which fuel costs were analyzed as a function of locomotive unit miles in road service. Through a subsequent process, those variable fuel costs are divided into separate categories that are apportioned as follows:

0.44069 to gross ton-miles;

0.53862 to locomotive unit miles – road service; and,

0.02069 to switch engine minutes.

The current URCS methodology does not account for important aspects of unit train operations that cause such operations to have significantly lower fuel intensity than the system average reflected by URCS. As outlined by AAR, railroads reduce fuel consumption by ". . . increasing how much freight is carried in an average rail carload and average train." 26/ While unit trains use approximately the same number of locomotives as other trains, they are

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25/ See 2011 URCS, page 244 and Worktable D3 Part 1, Line 164.

26/ Source: https://www.aar.org/keyissues/Documents/Background-Papers/Freight-RR-Help-Reduce-Emissions.pdf .

less fuel-intensive per GTM because, compared to other trains (as shown in Table 2), they tend to be substantially longer, and move cars that are somewhat heavier. In addition, they travel at speeds that entail relatively low levels of aerodynamic resistance compared to at least some other train types: 27/

Table 2

Train Characteristics

| | | East | West |
|---|---|---|---|
| | | | |
| Locomotives/train | Unit trains[28] | 2.3 | 3.1 |
| | Through trains[29] | 2.4 | 3.0 |
| | | | |
| Cars/train | Unit trains[30] | 93.6 | 110.4 |
| | Through trains[31] | 60.9 | 69.2 |
| | | | |
| Tons/car | Unit trains[32] | 82.5 | 84.9 |
| | Through trains[33] | 82.2 | 82.9 |
| | | | |
| Speed (mph) – March 2013[34] | Unit trains | | |
| | - Coal | 17.8-19.7 | 22.6-27.5 |
| | - Grain | 19.8-20.1 | 23.1-24.1 |

27/ See http://www.istc.illinois.edu/about/SeminarPresentations/20091118.pdf slide 36 .

28/ Source: 2011 URCS Worktable B3 Part 7, Line 716 Column 1.

29/ Source: 2011 URCS Worktable B3 Part 7, Line 718 Column 1.

30/ Source: 2011 URCS Worktable B3 Part 7, Line 724 Column 1.

31/ Source: 2011 URCS Worktable B3 Part 7, Line 726 Column 1.

32/ Source: 2011 URCS Worktable B3 Part 7, (Line 735 Column 1/Line 724 Column 1).

33/ Source: 2011 URCS Worktable B3 Part 7, (Line 737 Column 1/Line 726 Column 1).

34/ See http://www.railroadpm.org/ . Data presented for NS and CSX in the East, and BNSF and UP in the West.

Table 2 (continued)

Train Characteristics

| | | East | West |
|---|---|---|---|
| | | | |
| Speed (mph) – March 2013 | Through trains | | |
| | - Manifest | 21.7-23.1 | 21.5-22.7 |
| | - Multi-level | 23.8-24.0 | 24.9-27.3 |
| | - Intermodal | 29.5-30.3 | 31.9-34.9 |

Within physical constraints that may be imposed by yard trackage, passing sidings, loading and unloading facilities, etc., unit train lengths can be set to make efficient use of the capabilities of any given set of locomotives. In comparison, through trains inherently experience variations in block sizes and ladings that tend to prevent equivalent efficiency. Also, all else equal, longer trains of uniform cars tend to have lower aerodynamic resistance relative to (multiple) shorter trains made up of cars with varying dimensions and aerodynamic profiles.

The fact that these considerations lead to a demonstrable fuel efficiency advantage for unit trains relative to other rail traffic has long been evident. For example, even before the growth in unit train sizes that occurred after the Staggers Act, unit trains during the period 1977-1980 were estimated to produce 415 net ton-miles per gallon, or about 86% more than the overall average of 223 net ton-miles per gallon. 35/ Likewise, after approximately 20 years under the Staggers Act, a special study of fuel use by locomotives in coal unit train service

35/ See National Cooperative Highway Research Program, "A Guidebook for Forecasting Freight Transportation Demand", NCHRP Report 388 (Washington, DC; September 1997), Exhibit A-2. May be viewed at http://books.google.com/books?id=emrmcpmy4FUC&pg=PA50&lpg=PA50&dq=rail+intermodal+fuel+intensiveness&source=bl&ots=jngdbj2vFo&sig=hoPmzNuQgjORyNmdwWIJ8WCEWvk&hl=en&sa=X&ei=frxRUZq1G8e-0QHv-YGYCA&ved=0CDQQ6AEwCA#v=onepage&q=rail%20intermodal%20fuel%20intensiveness&f=false .

accepted by the Board for use in the PSC Pawnee rate case proceeding showed that the issue traffic achieved 621.9 net ton-miles per gallon, 36/ or about 57% more than the 396 net ton-miles per gallon for all rail traffic estimated by the AAR for the corresponding time period. 37/

Even more recent data were provided in the fuel use study submitted to the Board by AECC on May 15, 2006 in response to a request made by then-Chairman Buttrey during the public hearing conducted on May 11, 2006 in Ex Parte No. 661, Rail Fuel Surcharges. That study showed that unit train movements of PRB coal to two of AECC's plants were achieving 825-873 net ton-miles per gallon, approximately double the overall average of 414 net ton-miles per gallon for all rail traffic estimated by the AAR for 2005.

Thus, the evidence shows that actual fuel use per net ton-mile on unit trains in the west is on the order of 35-50 percent lower than the overall average. A portion of this difference reflects the fact that unit trains tend to generate fewer gross ton-miles in the course of moving a given number of net ton-miles. For example, URCS data show that in 2011 a total of 3.051 trillion gross ton-miles were generated by the Class I railroads 38/ in order to move 1.729 trillion net ton-miles of freight 39/, which yields a "gross-to-net" ratio of 1.765. In comparison, a unit train would generate as few as 1.383 gross tons per net ton, assuming fully loaded 286k

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36/ Developed from data presented in Docket No. NOR 42057, Public Service Company of Colorado d/b/a Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Decision served June 8, 2004, Table E-4, and from the fuel use study referenced on page 137.

37/ See AAR, "Freight Railroads Help Reduce Greenhouse Gas Emissions" (July 2012) at page 2.

38/ See Table 3, attached.

39/ See AAR, Class I Railroad Statistics (February 7, 2013), page 2.

cars with a lading weight around 120 tons and a tare weight of about 23 tons (typical of the lightweight aluminum cars used in many volume coal movements).

The Board's apparent practice in URCS of relying on average tare weights (e.g., including heavier steel cars along with the lightweight aluminum ones) instead of actual tare weights effectively ensures that URCS cannot and does not reflect the true and full savings associated with lightweight aluminum cars. If URCS allowed the user to specify the tare weight of the car, it would enable URCS to reflect the full savings of about 21.6% of fuel and other GTM-related costs relative to an average movement that is achieved when lightweight cars are used.

Similar to the situation with tare weights, the Board's decision not to permit the URCS user to specify the number of locomotives used in the movement causes a material overstatement of actual locomotive unit mile (LUM) costs for the more efficient unit train movements. URCS apparently computes locomotive requirements based on the size of the train relative to the average size for that type of train. For example, in the west, an average unit train has 3.1 locomotives and 110.4 cars. All else equal, URCS would treat a 135-car PRB coal train as if it required (3.1 x (135/110.4) =) 3.79 locomotives. However, in actuality such trains frequently are moved with 3 locomotives. In this instance, inability of the user to specify the actual number of locomotives overstates actual LUM costs by about 26.3 percent.

For a typical PRB coal train using lightweight aluminum cars, the combination of allowing the user to specify the tare weight (which reduces GTM-related costs by 21.6%), allowing the user to specify the actual number of locomotives (which reduces LUM costs by 26.3%), and excluding all fuel costs associated with switching, would reduce the assignment of

variable fuel costs by ((0.44069 x 0.216) + (0.53862 x 0.263) + 0.02069 =) 25.8% relative to average traffic. This would be significant, but still short of the 35-50 percent range discussed previously. This is because URCS still would not be accounting for such considerations as the fuel use savings associated with the aerodynamic advantages of unit trains relative to trains with mixed equipment types and higher-speed intermodal and multi-level traffic. Pending further study of unit train fuel use, a further credit to unit trains of not less than 9% (and not more than 24%) of the variable fuel costs associated with average traffic would be needed to ensure consistency between URCS and the best current evidence regarding unit train fuel use.

Road Property Depreciation

The physical wear of road property caused by rail traffic is a legitimate component of variable cost. However, the methods used in URCS to account for such costs do not appear to account for the fact that some road property investments are specifically related to particular commodities or traffic types. Extensive rail investment in recent decades has gone into specialized facilities not used by unit trains, particularly intermodal terminals and projects to create doublestack clearances. Even classification facilities generally are avoided by unit train traffic. While depreciation of specialized facilities still is a cost of the traffic that uses them, spreading the costs of investments in such facilities to all traffic creates impermissible cross-subsidies. URCS should segregate RPI investments that are specific to particular commodities or traffic types to make sure that other traffic movements are not forced to pay the bill for depreciation of categories of road property investments they do not utilize.

Return on Road Property Investment

In URCS, variable return on road property investment (RPI) cost is computed on the basis of application of a 50% "default variability factor" that is "based primarily on prior judgments by the ICC" and not on rigorous analysis or study. 40/ This approach may have had intuitive appeal as a method of accounting for capital costs, but it is inconsistent with relevant theoretical and empirical considerations in several respects. Returns arise from use of any asset only after the variable and other attributable costs associated with such use have been accounted for. Particularly in the presence of differential pricing, there is no basis on which to assert or assume that all traffic is created equal in its yield of return. Any given movement may yield a return that is large or small; the proposition that return can be assigned to any rail traffic measure is an artifact of a cost allocation mentality that defeats the purpose of differential pricing.

Empirically, treating any portion of return on RPI as additive to other variable costs misapprehends the entire purpose and effect of most such investments. Variable costs in other URCS categories are calculated as they were incurred as traffic moved over the road property assets then in service. Adding a return on RPI addresses the threshold that must be satisfied to draw RPI investment, but ignores completely the fact that such investments normally are only made if they produce benefits in excess of that threshold. Indeed, the actual return from road property investment typically arises in the form of reductions in operating costs for any given traffic level, so to the extent RPI investments are included in URCS, their net

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40/ See STB URCS Report to Congress at page 5.

effects on measured unit variable costs generally should be negative. 41/ This is a manifestation of economies of density, but is flatly ignored by the Board's current treatment of RPI in URCS.

On the basis of these considerations, Return on Road Property Investment should be eliminated from URCS.

Summary

Neither current practices nor the Board's proposals for URCS capture anywhere near the full efficiencies and savings associated with current unit train operations, particularly PRB coal movements made in lightweight aluminum cars.

The Board's proposed distribution of some costs on a "per shipment" basis is meritorious for the less-than-trainload shipments to which such costs apply.

A discontinuity between the costs of unit trains and less-than-trainload shipments is appropriate, and should not be eliminated through the changes the Board has proposed. A simple mathematical formula can be used to establish separate unit costs for unit trains and less-than-trainload shipments without requiring either a "make whole" adjustment or the harmful effects of the Board's proposal.

The following specific refinements are feasible and should be implemented to ensure the reasonable accuracy of URCS and the unit train cost estimates it produces:

- Allow the user to specify the tare weight of cars;
- Allow the user to specify the actual number of locomotives used by a unit train;

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41/ The Board's own consultants found that "(t)he elasticity of variable cost with respect to the way and structures capital is stable and statistically significant across the entire sample period. The capital-stock elasticity is negative, as implied by theory. That is, an increase in capital would lower variable cost." See Christensen Associates, Analysis of Competition, Capacity, and Service Quality (Volume 2) (November 2009) at page 9-9.

- Allow the user to specify the terms applicable to the use of private cars;

- Allow the user to specify any other optional inputs available in URCS as needed to ensure that cost components not relevant or applicable to a particular movement are excluded from its URCS costs;

- Do not adopt the proposed change (from 50 cars to 80 cars) in the threshold for a shipment to be deemed a trainload or unit train;

- Modify reporting requirements, including the Rail Waybill Sample, to ensure that shipments moved as unit trains are distinguished from shipments moved in way/through train service;

- Ensure that fuel costs deemed to be variable with switch engine minutes are omitted from the costs of unit trains;

- Provide a credit to unit trains of not less than 9% (and not more than 24%) of the variable fuel costs associated with average traffic to ensure consistency between URCS and the best current evidence regarding unit train fuel use, subject to refinement pending further study;

- Segregate road property investments that are necessitated by specific types or categories of traffic to ensure that URCS does not cross-subsidize such investments by allocating their depreciation expenses to other traffic;

- Eliminate Return on Road Property Investment (RPI) as a variable cost; and,

- Ensure railroad compliance with all reporting requirements that support URCS. Remove or subject to a higher standard of review any Board edits that overwrite or substitute for reported values.

In the future, further refinement of URCS models would permit additional cost-causing factors to be taken into account. For example, current URCS procedures essentially treat all gross tons as being "equal" with respect to their cost causality, notwithstanding the fact that unit trains generally move at substantially slower speeds than do intermodal and multilevel trains and therefore may not make the same contribution to maintenance needs for

track structure, railcars and locomotives. 42/ Given the evolution of train types with distinctly different operating characteristics, more refined analysis techniques will eventually be needed to account for the actual impacts of such factors on cost causality by different traffic types.

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42/ Indeed, a formula for "speed factored gross tons" once was required under Part 1157, Subpart A, Appendix III for some analyses of maintenance–of-way expenses. See http://books.google.com/books?id=KbY8AAAAIAAJ&pg=PA435&lpg=PA435&dq=speed+factored+gross+tons&source=bl&ots=9yy4xWSit6&sig=q3_PBsvMX0N2W4717uElk5DcYu0&hl=en&sa=X&ei=knldUdiXJa6j4APjgIHABQ&ved=0CCIQ6AEwAw#v=onepage&q=speed%20factored%20gross%20tons&f=false . This formula indicated that velocity increased the effective cost-causing significance of a given quantity of gross tons through its effect on momentum (i.e., the product of mass x velocity), kinetic energy (proportional to mass times the square of velocity) and other terms.

Table 3

GTM and Unit Train Data

| | | East | West | Total |
|---|---|---|---|---|
| | | | | |
| Gross Ton-Miles | Unit trains[43] | 259258416 | 1021408896 | 1280667312 |
| | Unit/way/through[44] | 870527744 | 2180302080 | 3050829824 |
| | Total[45] | 953459904 | 2399575808 | 3353035712 |
| | | | | |
| Unit Train | Car-miles[46] | 3143290 | 12024100 | 15167390 |
| | Locomotive-miles[47] | 76705 | 342075 | 418780 |
| | Train-miles[48] | 33599 | 108900 | 142499 |
| | | | | |
| Unit/way/through | Locomotive-miles[49] | 388160 | 971906 | 1360066 |
| | | | | |

43/ Source: 2011 URCS Worktable A1 Part 1, Line 119 Column 1.

44/ Source: 2011 URCS Worktable A1 Part 1, Line 122 Column 1.

45/ Source: 2011 URCS Worktable A1 Part 1, Line 123 Column 1. Includes GTM's of locomotives.

46/ Source: 2011 URCS Worktable A1 Part 1, Line 115 Column 1.

47/ Source: 2011 URCS Worktable A1 Part 1, Line 105 Column 1.

48/ Source: 2011 URCS Worktable A1 Part 1, Line 101 Column 1.

49/ Source: 2011 URCS Worktable A1 Part 1, Line 108 Column 1.

Certificate of Service

I hereby certify that this 20th day of June, 2013, I caused this document to be served, electronically or by first class mail, on all Parties of Record on the Board's Service List for this docket.

Eric Von Salzen