

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Telephone Number Portability) CC Docket No. 95-116

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U S WEST PETITION FOR
RECONSIDERATION AND CLARIFICATION

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Summary of Comments

U S WEST, Inc., which owns both an incumbent LEC and a new entrant LEC, asks the Commission to reconsider or clarify three aspects of its First Report and Order addressing implementation of permanent (or database) telephone number portability:

First, U S WEST asks that the Commission defer the implementation schedule by three to six months to help ensure the continued reliability of the public switched network. The Commission has given the industry very little time to make large and complex changes to the public switched network — less time than it allowed in connection with the conversion to 800 database (although 800 database involved far fewer tasks than number portability). Under the current schedule, carriers have no time to evaluate the results of the Chicago field test, much less react to those results. What is more, the current schedule does not give carriers adequate time to conduct stress, systems, and other tests within their own networks. For example, current estimates are that traffic loads on U S WEST's CCS network in the Minneapolis MSA will increase by approximately 280%; an increase in traffic loads of this magnitude is unprecedented. As explained in its petition, U S WEST believes that the current schedule adds an unnecessary degree of risk to the continued reliability of the public switched telecommunications network.

Second, U S WEST asks the Commission to reconsider its decision apparently precluding carriers from using the less costly QoR method of number portability. Admittedly, there are differences in call set-up times between the QoR and LRN methods. However, the industry should not be required to implement the more costly LRN method

unless (a) consumers will actually perceive this difference in call set-up times, and (b) if so, this difference justifies the industry's expenditure of an additional \$500-\$750 million to deploy LRN. Before the Commission requires carriers to incur additional sums implementing number portability, it should commission a survey of consumer perceptions of call set-up delay. Only then can the Commission know with confidence if additional implementation costs are warranted.

Finally, the Commission should clarify that implementation of database portability may be deferred until it resolves the cost recovery issues. As a matter of both law and policy, the Commission must put in place a mechanism for full cost recovery before it requires any carrier, but incumbent LECs in particular, to begin spending the enormous amounts necessary to implement number portability.

Specifically, the Commission needs to ensure that cost recovery can be implemented by January 1, 1997 so that all costs a carrier incurs in implementing the Commission's mandate (regardless of how the Commission may choose to classify such expenses) can be recovered over a three year period — the period carriers will likely be incurring the bulk of their portability implementation costs. Such a plan should enable incumbent LECs to meet the substantial financial burden that the Commission has imposed on them and their customers.

tion in service quality or network reliability when implemented,” the Commission declaring:

Jeopardizing the reliability of the network would stifle business growth and economic development, and endanger individuals’ personal safety and convenience. Consumers, both business and residential, have also come to expect a certain level of quality and convenience in using basic telecommunications services.²

The Commission also noted the critical role network reliability plays in the context of deploying the new portability system.³ Indeed, it was precisely “to identify technical problems in advance of widespread deployment, thereby safeguarding the network,” that the Commission ordered some members of the industry to conduct a field test of the new technology.⁴

U S WEST agrees that a field test is absolutely “necessary,”⁵ but, the test period actually established by the Commission is insufficient. As a result, the current deployment schedule adds an unnecessary degree of risk to the continued reliability of the public switched telecommunications network. At minimum, U S WEST encourages the Commission to reconsider U S WEST’s earlier recommendation that, before number portability is used with any live traffic in any region, the Commission give carriers not participating in the Chicago trial an additional three to six months to react to the learnings from the

² Order at 27 ¶ 48(5) and 31 ¶ 55.

³ See, e.g., *id.* at 43 ¶ 79 (“[W]e have a significant interest in ensuring the integrity of the public switched network as number portability is deployed nationwide.”).

⁴ *Id.* at 43 ¶ 79.

⁵ *Id.* at 41 ¶ 76.

Chicago trial, to conduct portability testing within their own networks, and to implement their first MSA.⁶

A. The Commission Has Given the Industry Very Little Time to Make Large and Complex Changes to the Public Switched Network

The introduction of permanent number portability will likely involve the largest and most complex change ever made to the public switched telecommunications network. The availability of number portability does not simply involve the deployment of several service management systems (“SMSs”) and the installation of new switch software. Number portability will change the operation of virtually every network component and supporting system because portability will fundamentally change the way calls are routed through the network: calls will no longer always be routed based on the dialed digits; rather, they will be routed based on a different, location routing number.⁷

Among other things, carriers must change virtually every one of their systems — ordering, capacity provisioning, maintenance, repair, and billing — because consumer telephone numbers may no longer identify the switch serving the business or residential customer. In addition, number portability will require inter-provider cooperation and agreements on network interconnection, operations, and processes.

⁶ See U S WEST Reply Comments, CC Docket No. 95-116, at 5 (April 5, 1996)(“U S WEST April 5 Comments”).

⁷ The matter is actually more complicated because sometimes during call processing carriers will route the call using the dialed digits while at other times they will instead route the call using the new location routing number.

Perhaps the closest analogy to the challenge the industry now faces is when it converted from 800 NXX access to 800 database access. But, as the following table documents, the industry was given more time to perform far fewer tasks when it implemented the 800 database system:

	<u>Status of System at the Time of the FCC's Implementation Order</u>	
	<u>800 Database</u>	<u>Number Portability</u>
Status of System	Partially operational (intraLATA only)	System does not exist
Number of SMSs	One	At least seven regional plus perhaps some state SMSs
Status of SMS	Operational	Specifications have not even been developed
SMS administrator	On the job	Not even selected
Switch software	Installed in some switches	Not available; currently under development
Modifications to systems	Some already completed	None completed; planning not even begun
Testing	Largely completed	Not begun; nothing installed to test
Volumes of queries	800 toll calls only	All local and all toll calls
Original FCC timetable	18 months	15 months
FCC approved delays	2 months	Unknown at this time

B. The Current Implementation Schedule Does Not Give the Industry Adequate Time to Evaluate and Act On the Results of the Chicago Field Test

U S WEST applauds the Commission's decision to require the industry to conduct a field test of number portability, and it further agrees that a "first office application" is essential "to identify technical problems in advance of [portability] deployment, thereby safeguarding the network."⁸ However, the schedule the Commission adopted is so compressed that the industry will not have an opportunity to review the test results (much less make necessary modifications) before it must begin using portability with live traffic in seven of this nation's most populous urban areas.

The Commission has directed carriers participating in the Illinois Local Number Portability Workshop to conduct in Chicago and to complete by August 31, 1997 the first field test of LRN ("or another technically feasible long-term number portability method").⁹ Carriers involved in this field test are further directed to submit a test results

⁸ Order at 43 ¶ 79. As U S WEST stated in its April 5 Comments (at 4-5):

Historically, any new technology designed for national use is first evaluated by one or two companies in a limited area. This "first office application" ("FOA") is undertaken to test the new technology, to allow time to find and eliminate bugs before the application is deployed more widely, and to provide valuable insight to assist the rest of the industry in its deployment of the technology. Experience demonstrates that the use of the FOA process generally reduces implementation costs and often expedites the overall deployment of new technology.

U S WEST agrees with AT&T that Atlanta and Chicago should be selected as FOA areas for the LRN routing plan and that this Commission should set the end of 3Q97 as the target date for completion of this FOA. Atlanta and Chicago are good FOA candidates because the Georgia Commission has already targeted July 1997 as the deployment date for LRN in Atlanta and because the Illinois Commission has targeted mid-1997 as the deployment date for LRN in Chicago.

⁹ Order at 42-43 ¶ 79. Acceleration of this field test is not possible because of the unavailability of needed software. According to the vendors, the earliest LRN software will become available is in March 1997, although the first LRN software for some major switch types will not become available until sometime during 2Q97 at the earliest. See *id.* at 39 ¶ 71.

report by September 30, 1997.¹⁰ However, carriers serving seven of the most populous MSAs — including those not participating in the Chicago trial — are told to begin installing and using LRN portability the following day, on October 1, 1997.

With the Commission's requirement that the first MSA become completely operational by December 31, 1997, it is apparent that more time will be needed to solve technical problems revealed in the Chicago trial. At minimum, all carriers not participating in the Chicago trial may need some time to evaluate the results and make necessary changes to their networks before number portability is cutover to live traffic.

C. Carriers Not Participating in the Chicago Field Test Should Be Given Additional Time for Their First Application

The Chicago trial will address generic (or industry-wide) issues with respect to equipment and software, but it will not address critical carrier-specific operational issues involving carriers not participating in the trial. For example, none of the considerations below will be addressed in the Chicago trial for carriers not participating in that trial:

- Network Engineering. Number portability requires that a new network function be performed on every local and toll call because carriers can no longer rely on the dialed digits alone to identify the switch serving the called party. Network components like switch processors, common chan-

¹⁰ Id. at 43 ¶ 79.

nel signaling (“CCS” or “SS7”) networks,¹¹ and “downstream” portability databases (or SCPs) must be sized correctly to avoid congestion or call blockage.

The problem network engineers now face is that they will not have access to even reasonably hard data about the capacity limitations of various network components until after they have placed their orders for the components. This is because reliable capacity information will not likely become available until 2Q97, at the earliest, when necessary software for switches and databases is supposed to become available.

Consequently, in placing orders for new network components, carriers must rely entirely on the vendor-stated estimates about the capabilities and capacities of their equipment. If those vendor estimates are overly optimistic (as has occurred in the past), carriers will unknowingly construct a network undersized for the task. An undersized network can result in congestion problems and the potential for failure — a situation which generally can be rectified only by ordering more equipment (*e.g.*, more processors) after the congestion or failure has occurred.¹² Additional time would

¹¹ CCS networks are the generic name assigned to out-of-band signaling networks. CCS networks are often referred to as SS7 networks because of the protocol — Signaling System No. 7 — currently used on most CCS networks.

¹² Sizing the network properly is especially important for the LRN method because a database dip must be performed on every call. Because QoR traffic volumes are instead based on the percentage of ported numbers, the capacity engineering challenge would be far more manageable.

give carriers considerably more assurance that their network has been sized correctly.

- Load/Stress Concerns. The LRN approach will result in a significant increase in the load on the network, especially on switches and the CCS network. With the LRN method, this increase will not be gradual; it will be a flash cut.

For example, U S WEST's incumbent LEC must convert its most populous MSA, Minneapolis, beginning 13 months from now and to complete this conversion three months later. Preliminary calculations indicate that the CCS traffic for Minneapolis will increase by about 280% over current CCS loads once the LRN portability feature is activated in full. One month traffic in Minneapolis will be stable at one level and the next month the traffic will increase as much as 280% more than the month before (because, with the LRN method, every interswitch call in the MSA will result in a database query). An increase in CCS loads of this magnitude is unprecedented.

Even assuming that sufficient capacity has been engineered into the network, there is no precedent for the significant increase in traffic load that will result when the LRN method is implemented. In the past, traffic has increased gradually, either because it was tied to service penetration or because the service/capability could be deployed in a sequential manner.

Such a gradual increase is not possible with the LRN method, which requires an immediate, flash cut increase in traffic volumes.¹³ Increases of this magnitude cannot be taken lightly, and this serves to re-affirm the critical need for all carriers to conduct stress and other tests on their own networks.

- System Stability and Reliability. New number portability software will be introduced into the network (*e.g.*, switches, databases and, perhaps, CCS switches or “STPs”) in major metropolitan areas at the same time as a sizable increase in traffic load occurs on these same network components. Experience teaches that the risk of a software reliability problem is usually at least three times higher at cutover than later in a product’s life cycle. In addition, the increased load may provide a greater chance of the software problem cascading to other equipment (as occurred with the large CCS outages in 1991), resulting in an even more catastrophic outage.¹⁴
- Impact on Backup Systems. CCS networks are purposefully engineered with redundancy. For example, one linkset or STP is designed to handle

¹³ This phenomenon would not be faced with the QoR method because, with QoR, the volume of database dips is based on the number of calls to ported numbers (as opposed to the total number of interswitch local and toll calls). U S WEST’s incumbent LEC estimates that traffic loads on its Minneapolis CCS network would increase only 35% (assuming 10% of all call attempts are made to ported numbers) — compared to the 280% increase with the LRN method.

¹⁴ This software reliability consideration applies equally to the QoR method, although the magnitude of the risk is not as great because far fewer database dips are performed (resulting in much smaller loads on the network).

the load of its mate if there is a failure to either a linkset or STP. However, successful operation of the CCS network under normal conditions does not guarantee that the network will be able to continue to operate when there is a major outage.

Doubling the traffic load on a link or STP node may not be problematic when the normal load is 10-15%, and hence the load under failure is 20-30%. However, if the normal load becomes 35-40% (because of portability traffic), then the load under failure is significant (70-80%). In theory, the link or node should be able to handle the load, but it is not clear that this will occur in reality. Even minor changes in the loading of links could make the network vulnerable. Internetwork interoperability test program trials have demonstrated that, when different sections of the software are exercised, CCS nodes can behave very differently under heavy load conditions than they do in normal operations.

Finally, if the network is running near capacity, then the probability that focused overloads will cascade into major long-term outages increases dramatically. Running at capacity risks more than congestion, it risks major failures from software problems, as well.¹⁵

¹⁵ Because QoR imposes a much smaller load on CCS network, this concern is not as substantial with that method.

- Systems Modifications. As noted above, the introduction of number portability will require carriers to modify virtually all of their systems, including ordering, capacity provisioning, maintenance, repair, and billing. Carriers must have an opportunity to test these inter-related systems before the systems are used to support live traffic.

The considerations listed above are carrier-specific, and carriers must have an opportunity to test their own network when operating the new portability system. U S WEST therefore recommends that the Commission extend the implementation schedule for a relatively short amount of time, thus enabling carriers to safeguard the integrity of the network.

* * *

In summary, carriers need time to review and evaluate the results of the Chicago test and to make necessary modifications based on the lessons learned from the trial. U S WEST therefore requests that the Commission reconsider its implementation schedule to allow time for these tasks.

While U S WEST believes that the number portability deployment schedule must be re-adjusted slightly, industry work on the regional SMS portability databases should continue. U S WEST submits that the Commission's assumption — several regional SMS portability database systems can be operational 13 months from now — is unduly optimistic. Among the work that must be completed are: the selection of regional SMS administrators; the design of SMS capabilities and interfaces; the purchase of new hard-

ware and software; the installation of new facilities; and, most importantly, testing. Given that all of these decisions and activities will be made as part of the cumbersome (but generally successful) industry consensus process, a target date of 13 months would appear to be unrealistic. Consequently, to ensure the availability of database portability is not needlessly delayed by the deployment of this critical network component, the Commission should re-affirm that the industry should proceed with regional SMS planning and implementation with all due deliberate speed.

II. The Commission Should Perform a Survey on QoR to Determine if Callers Are, in Fact, Negatively Impacted by this Portability Method

Permanent number portability can be implemented using one of two triggering methods: (1) Query on Release (“QoR”), where a database dip is launched only on call attempts requiring database queries (*i.e.*, calls to ported numbers); or (2) Location Routing Number (“LRN”), where a database dip is launched on every interswitch call attempt — whether or not the called party has a ported number. Although QoR is less costly to implement and operate than LRN (because LRN entails significantly more database dips which, in turn, require larger-sized networks), and although the two methods are compatible with each other (one carrier can use QoR while another uses LRN), the Commission appears to have prohibited all use of QoR.¹⁶ The Commission has stated:

¹⁶ See Order at 30 ¶ 54 (“We recognize that this [fourth] criterion will effectively preclude carriers from implementing QoR.”). However, the prior sentence suggests that carriers can implement QoR so long as there is agreement amongst themselves. See also id. at 30 ¶ 53 (“We note that this [fourth] criterion does not prevent individual carriers from determining among themselves how to process calls, including a method by which a carrier voluntarily agrees to use the original service provider’s network.”).

[M]ethods which first route the call through the original service provider's network in order to determine whether the call is to a ported number, and then perform a query only if the call is to be ported, would treat ported numbers differently than non-ported numbers, resulting in ported calls taking longer to complete than unported calls.¹⁷

Although the Commission's concern about longer call set-up times is warranted, the real question is, what is the impact on the caller? Specifically, will the caller even notice the difference in set-up time? U S WEST believes that the Commission's inquiry concerning QoR should focus on whether the differences in call set-up time between the QoR and LRN methods would be perceived by consumers such to justify the imposition of a more costly method of number portability.¹⁸

As noted above, there are differences between the QoR and LRN methods, differences which result in variances in call set-up times. LRN requires a database dip on every interswitch call attempt; this dip consumes approximately 500-980 milliseconds (or one-half to one second). In contrast, QoR, because of its efficiency, launches a database dip only on calls directed to ported numbers. This means that calls destined to ported

¹⁷ *Id.* at 29 ¶ 53.

¹⁸ The Commission has concluded that there is "little evidence in the record to support the claim that allowing carriers to implement QOR would result in significant cost savings." *Order* at 30 ¶ 54. U S WEST acknowledges that the cost saving involved with QoR compared to LRN appears to be in the 10-15% range only. But cost savings of 10-15%, when applied to U S WEST's incumbent LEC's portability implementation costs, represents \$50 to \$75 million — or more. When translated to the industry as a whole (and considering that U S WEST's incumbent LEC serves approximately 10% of this nation's access lines), use of LRN rather than QoR would likely result in additional industry expenditures of \$500 to \$750 million nationwide. However, U S WEST's discussions with other carriers suggests that the nationwide impact of deploying LRN over QoR may exceed \$1 billion.

numbers will involve 500-980 milliseconds in call processing that will not be encountered in calls to non-ported numbers.¹⁹

Delay is caused by many factors, including the type of signaling used on the trunks a given call traverses, the type of switches the call traverses,²⁰ and the number of switches a call traverses.²¹ Indeed, a customer served by a switch using MF signaling today would actually realize a noticeable decrease in call set-up time when CCS is added to support number portability — notwithstanding the fact that portability (whether QoR or LRN) may add a database dip not performed previously.

The subject of call set-up time involves perceptions by callers — that is, will callers actually experiencing an increase of, say 500 or 1,000 milliseconds, even notice the increase? The Commission will recall the considerable controversy that brewed some years back in connection with its 800 database (Docket 86-10) proceeding. Some warned of dire consequences unless the entire public switched network was converted to CCS signaling. The Commission rejected these extremist views.²² Some U S WEST custom-

¹⁹ QoR also involves the “look-ahead” function, whereby a CCS signaling message is transmitted to the switch assigned the NXX code in the dialed digits. Current estimates are that this “look-ahead” function will consume less than 500 milliseconds in call processing. However, because this “look-ahead” function would be performed on all call attempts (to both ported or non-ported numbers), this time would not appear to be relevant to a customer perception analysis.

²⁰ The data submitted in the Docket 86-10 800 database proceeding revealed significant differences in set-up times between various switch types.

²¹ While many local calls traverse only two switches, some traverse three: (1) the switch serving the calling party; (2) a local tandem switch; and (3) the switch serving the called party. Obviously, a call involving only two switches will be set-up faster than a call involving three switches. Under the logic of QoR opponents, incumbents should be precluded from direct end-office-to-end-office connections if a new entrant decides to connect to a local tandem (requiring its calls to traverse three switches).

²² Instead, the Commission specified that the mean post-dial delay within the originating network for 800 calls should be 2.5 seconds. See 800 Access Service, 6 FCC Rcd 5421 (1991). Both LRN and QoR are

Continued on Next Page

ers experienced several seconds of new delays when their 800 calls began using the database method, yet U S WEST received no complaints following that conversion.

Does the difference in call processing time make a difference to consumers and, if so, does this difference justify the industry's expenditure of an additional \$500 million to \$1 billion to deploy LRN?²³ It is these questions which U S WEST believes the Commission should address in the debate over whether carriers should have the flexibility to use QoR method. Specifically, before the Commission requires carriers to incur additional sums to implement number portability, it should commission a survey of customer perceptions of call set-up delay. Only then can the Commission know with confidence if the additional implementation cost is warranted.

III. The Commission Should Clarify That Implementation of Database Portability May Be Deferred Until It Resolves the Cost Recovery Issues

The Commission has directed landline carriers to begin using database portability for the public's traffic by October 1, 1997, only 13 months from now. Although carriers must finance the purchase of equipment and the modifications of their networks and support systems by this deadline, the Commission has not yet announced how carriers will recover their costs after making the investment. Many costs must be incurred before the new capability is activated in 13 months. What is more, at this time the industry does not

well within this previously approved (and given, the absence of complaints, obviously successful) post-dial delay standard.

²³ See note 18 *supra*.

even know whether the new technology will work as promised; necessary software does not now exist; and the first test of LRN is not even scheduled until next summer.

As a matter of both law and policy, the Commission must put in place a mechanism for full cost recovery before it requires any carrier, but incumbent LECs in particular, to begin spending the enormous amounts necessary to implement number portability. The public interest is not served by spending vast sums on a technology that is still confined to the development room. Early and rapid cost recovery is particularly important because meeting the Commission's timetable requires carriers to purchase equipment before it has even been tested, and there is no assurance, other than promises of vendors (which profit by the sale of any new equipment), that the new system will work properly.

Moreover, carriers have both a statutory and a constitutional right to recover in a timely manner the costs they incur in providing governmentally-mandated services. Because the portability requirement is a federal mandate, the Commission is the agency responsible for ensuring that carriers have a reasonable opportunity to recover their portability costs in full. This cost recovery mechanism must be in place before the costs are incurred for two reasons.

First, costs not recovered at the time they are incurred are unlikely ever to be recovered. In an intensely competitive environment, as the local exchange market will soon become, market forces rather than regulatory rate orders will determine how much a LEC can actually charge. Incumbent LECs in particular are likely to find it impossible to collect a charge for which no current benefit accrues to the consumer — even if the

Commission retrospectively allows them to impose a charge to cover costs incurred earlier.

Second, if costs are incurred as a result of a government mandate but recovery is left to the uncertain future, there will be distorting effects on the investment in implementation, the use of number portability facilities, and the relationships among providers and between providers and customers. These distortions will not be amenable to retrospective unscrambling and cure.

As U S WEST detailed recently in another filing,²⁴ the Commission needs to ensure that cost recovery can be implemented by January 1, 1997 so that all costs a carrier incurs in implementing the Commission's mandate (regardless of how the Commission may choose to classify such expenses) can be recovered over a three-year period — the period during which carriers will likely be incurring the bulk of their portability implementation costs. Such a plan should enable incumbent LECs to meet the substantial financial burden the Commission has imposed on them and their customers.

IV. Conclusion

U S WEST, Inc. has been, and remains, committed to the widespread availability of database portability. After all, one of U S WEST's new entrant LECs is spending \$250 million in the Atlanta area alone to upgrade its cable network to support telecom-

²⁴ See U S WEST Comments, CC Docket No. 95-116 (Aug. 16, 1996).

munications. The early availability of permanent number portability is critical to this venture's success in the market.

However, new systems should not be implemented irresponsibly, and finite capital should not be squandered. In U S WEST's judgment, cash outlays for number portability should be made only after the Commission has developed an adequate cost recovery plan (or given all carriers the flexibility to determine how to recover their implementation costs). Even then, carriers should not be required to spend extra dollars to deploy a portability method until it has surveyed consumers to determine whether service quality provided by an alternative approach is acceptable to them. The Commission has a legal obligation to ensure cost recovery before carriers must make the investments in a government-mandated system.

For all the foregoing reasons, the Commission should commission a study to determine customer perceptions of the QoR approach. It should also confirm that carriers need not begin implementing database portability (QoR or LRN) until (a) the Chicago trial scheduled for next summer is completed successfully (thus providing some assurance that the new technology actually works as promised), and (b) the Commission has put in place a plan giving each carrier the opportunity to recover in full its portability

implementation costs. However, the industry should continue its important work regarding SMS planning and implementation.

Respectfully submitted,

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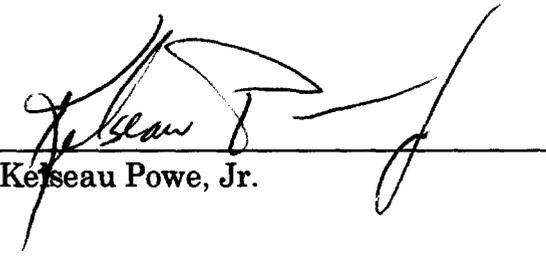
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August 26, 1996

CERTIFICATE OF SERVICE

I, Kelseau Powe, Jr., do hereby certify that on this 26th day of August, 1996,
I have caused a copy of the foregoing **U S WEST PETITION FOR
RECONSIDERATION AND CLARIFICATION** to be served via first-class United
States Mail, postage prepaid, upon the persons listed on the attached service list.


Kelseau Powe, Jr.

***Via Hand-Delivery**

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