DT 99-020

Investigation of Congestion on the Public Switched Telephone Network

Order Addressing Issues Raised by Internet Service Providers

O R D E R N O. 23,666

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I. PROCEDURAL HISTORY

The New Hampshire Public Utilities Commission (Commission) initiated this investigation by Order of Notice on February 8, 1999, to seek a solution to deteriorating service to New Hampshire telephone customers caused by Athe proliferation of Internet usage.@ *Re Congestion on the Telephone Network Caused by Internet Traffic*, 84 NH PUC 220 (1999). At that time the Commission had received increasing consumer complaints regarding fast-busy signals and dial-tone delay, substantiated by monthly reports from Verizon New Hampshire (then New England Telephone and Telegraph Company d/b/a Bell Atlantic-New Hampshire, hereinafter referred to as Verizon). The Commission=s Order of Notice made all incumbent local exchange carriers mandatory parties to the docket.

During February and March 1999, requests for intervention were filed by Valley Net, Inc.; Global Naps, MonadNet Corporation, BayRing Communications, WorldPath Internet Services, MCI WorldCom, TTLC, FCG Networks, MV Communications, Inc.; Destek Networking Group, Metro2000, Inc.; John Leslie Consulting, Digital Entropy, North Country Internet Access, BIT-NET Internet Services, Landmark Net Access, Sugar River Valley OnLine, Vitts Networks, Inc.; and NEVD of New Hampshire, LLC. Written comments regarding congestion and the Internet were filed by six members of the public.

On April 5, 1999, the Commission issued Order No. 23,185 adopting a procedural schedule, granting all requests for intervention, and approving an agreement among the parties and Staff to proceed in a collaborative effort, rather than a formal proceeding. The collaborative effort proceeded in a series of technical sessions through November 1999. At that time a number of intervenors indicated that they had joined the New Hampshire ISP Association (NHISPA) and chose to participate in this docket as one party represented by NHISPA. Those parties represented by NHISPA include ValleyNet, Inc., FCG Networks, MV Communications, Destek Networking Group, John Leslie Consulting, Metro2000, Inc., North Country Internet Access, Sugar River Valley Online,

Seabreeze Communications, TTLC Internet, and Turnpike Technologies.

In November of 1999, having exhausted the collaborative process without coming to a consensus solution, all parties and Staff agreed to move forward in a formal proceeding pursuant to a revised procedural schedule. By letter dated November 30, 1999, Verizon summarized the progress made by the collaborative; by letter dated December 23, 1999, NHISPA presented its view of the issues and recommended that the Commission take certain actions. Order No. 23,395, issued by the Commission on February 2, 2000, approved the revised procedural schedule. The Office of the Consumer Advocate (OCA) joined the formal proceeding as a party.

Prior to the hearings held in November 2000, multiple procedural schedule revisions occurred in response to the calendar and discovery needs of parties and Staff. Testimony was filed by NHISPA on February 17, 2000 and by Verizon on March 28, 2000. Because of a dispute over data responses, Staff did not file testimony on the expected date, having filed a Motion to Compel Discovery on March 24, 2000. After significant time elapsed during which NHISPA and Staff attempted unsuccessfully to resolve the discovery issues, the Commission granted Staff=s Motion to Compel on May 31, 2000 and NHISPA filed supplemental responses on June 30, 2000. Staff filed its testimony on July

11, 2000. Settlement discussions proved unfruitful; an evidentiary hearing was held on November 2 and 3, 2000. In December, 2000, briefs were filed by the OCA, NHISPA, Vitts Networks, Inc., and Verizon. A group of independent incumbent local exchange carriers (hereinafter, the Independents) submitted a memorandum regarding the effect of the docket on their respective companies.[1] Staff filed a letter reaffirming the positions in its filed testimony.

II. BACKGROUND

A. Congestion on the Network

Network congestion occurs when the public switched telephone network (PSTN) is unable to accept, transmit, or terminate the traffic sent to it from customers. The PSTN was designed and engineered to process voice traffic. Data traffic has different characteristics which, when combined with an overall increase in traffic, stresses the capacity of switches and the umbilical trunks that connect remote switches to the central office (CO). Instead of carrying the traffic, the network will respond with either a fast busy signal or with delayed- or no- dial tone.

[1] Those companies include Granite State Telephone, Inc., Merrimack County Telephone Company, Inc., Wilton Telephone Company, Inc., Hollis Telephone Company, Inc., Dunbarton Telephone Company, Inc., Northland Telephone Company of Maine, Inc., Bretton Woods Telephone Company, Inc., and Dixville Telephone Company.

The engineering explanation of the PSTNs:s inability to carry traffic reliably involves the inadequate capacity of line units and umbilical trunks. A line unit terminates 512 or 640 customer lines and provides a talk-path connection into the switch; there are 64 talk paths into the switch. Thus, when 64 customers in the same line unit are on the phone, all 64 talk paths are occupied in the line unit. The 65th customer wishing to place a call has to wait for one of the 64 others to disconnect before receiving dial tone. The 65th caller in a line unit will experience delayed or no dial tone. Similarly, when 64 talk paths are occupied in the line unit, a caller attempting to reach a phone-owner whose line terminates in that line unit will not be able to do so. Instead, the caller will experience terminating blocking, denoted by a fast busy signal. In both scenarios, the network is congested and fails to deliver the service expected.

Statistical measurements of dial-tone speed and terminating blocking identify the extent of network congestion. Dial-tone speed is measured by the percentage of call attempts made during the busy hour which obtain dial-tone within three seconds. The Commission standard requires that Verizon attain a dial-tone rating of 98%. Terminating blocking is measured by the percentage of call attempts that are terminated without

triggering the fast busy signal. The Commission standard requires that Verizon attain a terminating blocking rating of 97%. *Re New England Telegraph and Telephone, Inc. d/b/a NYNEX*, 82 NH PUC 30,36 (1997).

Network congestion also triggers fast busy signals when there is insufficient capacity on umbilical trunks between remote switches. Remote switches are connected by umbilicals to the host switch. If the traffic exceeds the available capacity in either the originating or terminating line units or the umbilicals, a call will not be completed.

The effect of network congestion, in addition to inconveniencing individual customers, can create a threat to public safety. In 1998 the Commission responded to a police complaint regarding congestion in Farmington that interfered with access to 911 assistance. The Commission permitted Verizon to disconnect 24 of an ISP=s business lines, improving dial-tone speed, until Verizon could reroute all of the ISP=s lines to another switch. In addition the ISP agreed to purchase trunk-side service. These actions reduced congestion in the Farmington switch to acceptable levels.

B. Efforts to Relieve Congestion

During 1998 and 1999, the Commission worked with Verizon to solve ongoing congestion difficulties. Verizon agreed to monitor congestion more closely and to correct the problems identified by load balancing in affected COs and, if necessary, by adding line units. Monthly reports to the Commission from Verizon tracked the ten most congested COs.

As a result of the collaborative process undertaken in this docket, Verizon proposed a plan to: (1) migrate data traffic off the PSTN to a fast-packet data network, (2) use a new diagnostic tool to accurately detect high use lines in order to strategically distribute high use lines among line units, (3) balance the load among line units and/or add new line units and umbilical capacity, (4) facilitate the migration of ISPs away from line-side service to trunk-side service such as flexpath and primary rate ISDN (PRI) by offering an amortized Centrex contract termination liability, and (5) offer internet protocol routing service (IPRS) allowing the routing of aggregated traffic over fast-packet data networks.

Verizon implemented parts of its plan. Two ATM switches are in service to facilitate transition to a fast-packet data network[2] and provide IPRS, which is being tested (parts 1

[2] The transfer of these ATM switches to Verizon Advanced Data Services, Inc., a separate affiliate, was provisionally approved by Commission Order No.

and 4 above). The diagnostic tool is operational (part 2 above). Line units, switch modules, and umbilicals have been added in congested areas (part 3 above). The special contract has been made generally available (part 4 above). It is Verizon's position that implementation of the complete plan will solve the problem of congestion on the network.

III. POSITIONS OF THE PARTIES AND STAFF

A. NHISPA

NHISPA argues that the steps proposed and undertaken by Verizon are not adequate to tempt ISPs away from the line-side of the network and will therefore not alleviate congestion. NHISPA recommends the Commission order two major changes in the way Verizon conducts business with ISPs in order to solve network congestion problems while encouraging advanced telecommunications services and without unduly harming ISPs.

1. NHISPA argues that Verizon should forego the termination liability contained in its Centrex contracts with ISPs when ISPs migrate from the line-side to the trunk-side of the network. NHISPA points out that Verizon's Centrex service was the only retail product available to them at the time they began offering internet services. In response to the Commission's perception that ISP use of Centrex was a major

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23,570, issued October 24,2000.

contributor to network congestion, the ISPs offered to move as much of its traffic off of Centrex as possible. In return for what the ISPs consider a concession and a cooperative effort, NHISPA requested that Verizon waive the termination liability provisions of the ISPs current Centrex contracts, inasmuch as Verizon=s poor planning is the root cause of congestion. Verizon=s refusal to waive termination liability is unreasonable, in NHISPA=s view, because the early termination penalties were put in place in order to protect Verizon captive ratepayers from paying for underutilized facilities. Considering ISPs= early termination is caused by overutilization, NHISPA argues no such penalties are justified. Imposing the penalties, according to NHISPA, would be unjust, anti-competitive and punitive. Furthermore, NHISPA declares that the termination charges cannot be justified on other grounds. According to NHISPA, the charges do not represent stranded investment because Verizon has previously recovered its capital costs invested in Centrex; nor are they justified under a sanctity of contract argument because the Centrex tariff was not negotiated freely between equal parties.

In addition to calling for the Commission to remove any obligation to pay termination liability incurred by ISPs migrating off the line-side of the network henceforth, NHISPA

requests what it characterizes as reparations for members who incurred such termination liability by migrating off the line-side during the past three years. As support, NHISPA states that repayment of unjust penalties is necessary in order to observe the statutory and constitutional guarantees that rates be reasonable. NHISPA cites to the equitable theory of Aunjust enrichment@ and the general principles of restitution referenced by the New Hampshire Supreme Court in *Appeal of Granite State Electric Company*, 120 N.H. 536 (1980).

2. In addition to forgiving termination penalties, NHISPA argues that Verizon should offer Adry copper@ as a retail tariffed service to ISPs and data networking companies. Dry copper consists of copper loops that have no electronics or power connected and have been Aconditioned@ by removing any load coils, bridged taps or other devices used in the provision of voice services, that cause interference with data transmission. According to NHISPA, dry copper is already offered at retail by Verizon as so-called BANA loops used for alarm purposes. BANA loops can be Aconditioned@ or not, however, and NHISPA requests the Commission require Verizon to provision individual BANA loops with a certification as to its status. NHISPA avers that Verizon currently provides this certification in its provision of xDSL service so providing it to ISPs should not be a problem.

NHISPA argues that a dry copper retail tariff will allow ISPs and high use end-users to migrate off of the line-side, thus reducing congestion. A dry copper retail tariff is the only financially reasonable way to accomplish that goal, according to NHISPA, and thereby maintain high-speed internet and data networking capabilities for rural New Hampshire. The only alternative to dry copper would be for ISPs to interconnect with Verizon pursuant to the Telecommunications Act of 1996 (TAct) in order to obtain the ability to collocate in a Verizon CO **B**- an option NHISPA avers is prohibitively expensive.

NHISPA argues that a dry copper retail tariff makes economic sense for Verizon. Verizon can avoid investing in analog equipment that will become obsolete in the foreseeable planning horizon while benefitting from sales to ISPs. At the same time, New Hampshire customers will benefit from lessened congestion and increased choices for obtaining high speed Internet access.

3. NHISPA makes a claim under RSA 365:38-a for recovery of its expenses associated with this docket, arguing that recovery of these costs is in the public interest as defined in that statute. According to NHISPA, recovery is in the public interest because NHISPA=s participation provided the Commission with information necessary to understand network usage and to

assess and design means of alleviating congestion. Even if the Commission does not adopt NHISPA=s positions, NHISPA maintains that the Commission will have substantially relied on NHISPA=s participation in the docket. NHISPA asserts that it should be compensated for its dedication and diligent attention to solving the problem of network congestion. But for the participation of NHISPA, it argues, no data relative to ISPs would have been available. Compensation will act as an incentive for future participation of similar associations as telecommunications becomes more intertwined with internet services.

B. Vitts

Vitts posits that the accelerated wide-spread deployment of Digital Subscriber Line in its many forms (ADSL, SDSL, HDSL, IDSL, RADSL, hereinafter referred to as xDSL) will alleviate the problem of congestion. Vitts argues that xDSL is the only reasonable and economical alternative to accessing the Internet via copper loops, and therefore the Commission must remove the obstacles raised by Verizon that needlessly impede the necessary deployment of xDSL. As discussed below, the obstacles include distance limitations on unbundled xDSL loops, excessive charges to condition, to qualify, and to pre-qualify loops for xDSL, and the placement of digital loop carrier systems.

Verizon currently limits xDSL loops to 18,000 feet away from the Verizon CO, pursuant to its current wholesale tariff (Statement of Generally Available Terms). Vitts argues that Verizon=s refusal to provision longer xDSL loops prevents CLECs from selling xDSL service to rural customers located further away from the CO. Because Verizon=s witness agreed that much longer distances are technically feasible for xDSL equipment to work, Vitts argues that Verizon=s restriction is unjustified. The distance limitation is only in place because Verizon itself is unable to provide the longer length service to its own customers. The distance limitation, therefore, becomes an obstacle to competition when applied to CLECs. Vitts urges the Commission to eliminate distance references in the SGAT, pointing out that the Massachusetts Department of Telecommunications and Energy (Mass DTE) approved a Verizon-Massachusetts elimination of such references to distance in the Massachusetts wholesale tariff. Vitts also cites a November 15, 2000 letter to the Commission in which Verizon-New Hampshire indicates that it will eliminate such references in New Hampshire upon Commission order.

Conditioning loops is the process of removing line disturbers such as load coils so as to permit unimpeded data speed over copper loops. Verizon=s charges for conditioning are prohibitively high, according to Vitts. Because most CLECs are

not able to absorb the cost of loop conditioning and must pass the cost on to customers, the effect is to stymy the growth of xDSL. Customers remain on dial-up connections and continue to create congestion on the network. According to Vitts, the Commission should require that Verizon eliminate loop conditioning charges, as did the Mass DTE. Vitts reported that the Mass DTE determined that loop conditioning charges are unjustifiable in a wholesale tariff calculated on a forward-looking fiber-based network because such a fiber-based network would not contain line disturbers and therefore would not require conditioning.

Vitts also argues that loop qualifying charges should be disallowed, for the same reason detailed above. In a fiber-based network, all loops would qualify. Furthermore, qualifying charges, according to Vitts, cause CLECs to make the gamble that a loop is qualified and then pay the price in terms of delays and customer dissatisfaction when the loop turns out to contain line disturbers.

Vitts objects to Verizon=s Digital Loop Carrier system. According to Vitts, CLECs may only provide access to the Internet to customers on a DLC by an ISDN-like service at 144 kBps or by expensive T-1 services. Vitts proposes that Verizon should file a tariff for the more economical APlug & Play@ collocation

option. Plug & Play provides economical access to DLC and remote terminal enclosures via CLEC electronics which plug into the remote terminal. CLECs would give Verizon electronic cards that Verizon then plugs into compatible equipment and assigns it as necessary to a concentrating device in the CO. The result is that the customer accesses the Internet without transmitting data on the PSTN.

Like NHISPA, Vitts asserts that a Verizon-offered tariff for dry copper will facilitate the migration of ISP customers off the PSTN. Vitts states that dry copper is identical to the conditioned loops that CLECs obtain at extra expense. Accordingly, Vitts insists that any dry copper retail tariff must be available to CLECs at wholesale as a matter of fairness and economics.

Vitts does not support arguments that the Telecommunications Act of 1996 requires or prohibits resale of dry copper. Stating that dry copper is not a service but is an unbundled element, Vitts claims that CLECs are not requesting a resale opportunity but a UNE opportunity in this case.

Finally, Vitts supports the NHISPA argument that all termination liability for ISP contracts with Verizon should be waived. Doing so will have a direct correlation to the disappearance of network congestion related to internet use and

Verizon will not experience financial harm since there is a clear market for the newly freed Centrex loops.

C. Verizon

Verizon attributes network congestion to multiple causes in addition to dial-up internet access. Congestion is also affected by lower toll rates, cellular phone use, second and third lines at single addresses, and increased population. As an active participant in the collaborative portion of this docket, Verizon has implemented a number of measures to prevent excessive congestion on the PSTN, measures that Verizon argues are sufficient.

Specifically, Verizon's efforts at load balancing, adding switch line units, and monitoring and enhancing umbilical capacity have driven down the concentration ratio of end-user lines to talk paths into the switch statewide. Congestion has not been completely eliminated but the essence of the problem is its unpredictability caused by changing consumer telephone usage patterns.

Refuting arguments by NHISPA, Verizon declares that the predominant method of accessing the internet will continue to be through dial-up modems using the PSTN for the foreseeable future. Increased usage due to cell phones *et cetera* will also continue, so migration to DSL or cable internet access may not necessarily

decrease congestion. Verizon will therefore continue its efforts to enhance the PSTN=s capacity. Accordingly, Verizon=s investments in the PSTN will not be stranded.

Verizon also argues that its transfer of certain advanced services assets to its subsidiary will not inhibit Verizon=s ability to use advanced technology. Verizon can acquire that technology for its use despite the fact that it may no longer sell the advanced services to customers.

Regarding its tariffed Centrex contract charges, Verizon argues vehemently that the termination charges are not properly labeled and should not be disallowed. Verizon characterizes these charges as one-time, up-front charges, identified as Schedule A charges in the Centrex Service tariff, which customers are permitted to pay over time (up to seven years). When a customer chooses to end its relationship with Verizon before the charges are fully paid, those up-front charges become due in full. The charges are not penalties, according to Verizon, they are merely the legitimate bargain agreed upon by both Verizon and the customer. Depriving Verizon of its bargain would be unjust and would also unjustly discriminate against ISPs that have already paid the charges and against non-ISP customers who are still subject to the charges.

In Verizon=s opinion, dry copper will not solve or even ameliorate the congestion problem effectively, given the problems that it will cause and the small number of users that are likely to migrate to it. Among its problems are: (1) its unknown price point means it is not proven to be an attractive or even possible alternative method for inducing migration, (2) the small geographic area it would serve, close to Verizon=s CO, means it will not serve rural New Hampshire; (3) the interference it may cause to other customer services provided by Verizon or by CLECs; and (4) its inefficient use of copper loop resources.

Verizon also warns that offering dry copper as a retail service will encourage the formation of unregistered and unregulated telecommunications carriers. Unlike CLECs, which directly compete with ISPs, the unregulated carriers will not be subject to consumer protection regulations and other public interest requirements. This will negatively affect consumers and will unfairly discriminate against the CLECs.

D. The Independents

During the course of this docket, according to the Independents, no network congestion issues were identified on the Independents= respective PSTN. Without an evidentiary basis, the Commission should not implement any remedial measures affecting

the networks, Centrex contracts, or any other offerings by the Independents, they argue.

Moreover, the Independents dispute the Commission=s jurisdiction over dry copper. Because the dry copper is a digitally conditioned loop for the purpose of accessing the Internet using DSL technology, the Independents maintain the service is jurisdictionally interstate. According to current law, embodied in the FCC decision in *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket Nos. 98-147, et al., Order on Remand, FCC 99-413, DSL access service is an interstate exchange access service.

The Independents also point out that DSL access services are currently available through Various ILEC internet tariffs, including the National Exchange Carrier Association, Inc. tariff FCC No. 5. ISPs wishing to obtain DSL access services, the Independents argue, should obtain them from interstate tariffs rather than demanding dry copper in this docket.

E. OCA

The OCA argues that Verizon=s plan to deal with congestion is inadequate and that the Commission should order Verizon to produce a better plan to address the problem by moving data traffic off the PSTN altogether. According to the OCA, each prong of Verizon=s plan is ineffectual. First, migrating users to a fast-packet data network cannot happen because of the Bell Atlantic-GTE merger condition requiring the transfer of advanced services equipment to a separate, unregulated subsidiary for at least the next three and a half years. Second, the diagnostic tool Verizon proposed for better monitoring does not contain reasonable thresholds to trigger timely congestion relief. Third, Verizon's choice to grow the existing network by adding line units is only a short-term solution, demonstrably ineffective. Fourth, migration to the trunk-side of the PSTN fails to accomplish migration off the PSTN. And fifth, Verizon=s Internet Protocol Routing Service is an advanced service assigned to Verizon=s new subsidiary and unavailable for Verizon to supply before 2004.

The OCA urges the Commission to require Verizon to retain high-speed packet-based services to accomplish a cost-effective, efficient network. The OCA argues that such retention is not prohibited by Verizon's merger conditions. In support of

its argument, the OCA cites to a recent Federal Communications Commission (FCC) order allowing Ameritech/SBC to own and operate advanced services equipment subject to specific terms and conditions. CC Docket No. 98-414, Second Mem. Opinion and Order dated September 8, 2000.

In order to better monitor network congestion, the OCA proposed that the Commission mandate additional service quality reporting by Verizon, fortified by financial penalties. The OCA contemplates minimum requirements for High Day Reports for all switches that exceed current congestion thresholds by more than 20%; Peg Count Reports for delayed dial tones, blocked calls, etc. in switches exceeding thresholds by 20% for any of those events; monthly reports of ISPs changing to the trunk-side, indicating what switch(es) are involved and how many voice-grade lines the ISP still uses for Internet traffic; and monthly reports detailing what switches are congested or may become congested, including planned relief and the date by which congestion will clear. In the OCA view, additional reporting, supported by fines and penalties as a financial incentive, will effectively permit New Hampshire to avoid future congestion because congestion is caused by monopoly neglect of the PSTN and Verizon would be less likely to neglect its responsibility.

In addition to more detailed reporting, the OCA recommends that customer complaints of congestion should be filed directly with the Commission in order to corroborate the monthly reports.

The OCA argues that Verizon should be held financially accountable for network congestion. Averring that congestion is the result of Verizon=s neglect of the network and poor planning, the OCA advises imposing fines and penalties in amounts of hundreds of thousands of dollars, comparable to those made in a Maine dial-tone-speed docket.

Furthermore, the OCA suggests that Verizon design a bill insert to educate customers as to its efforts and minimize any need for legislative inquiry into congestion. The costs of this effort, the OCA argues, and the costs of network upgrades to deal with network congestion should be borne by Verizon shareholders. The estimated cost of line units and associated equipment is $30.2 million but may be three times that amount. The OCA argues that the proceeds from Verizon=s transfer of advanced services equipment to its subsidiary could be used to pay for the network upgrades.

Because Verizon has been on notice that internet traffic would have a significant impact on the PSTN, the OCA sees no merit in penalizing ISPs for early termination of contracts

with Verizon. Verizon entered into those contracts with knowledge of their deleterious effects. Furthermore, the termination liability Verizon wishes to enforce halts ISP migration to the trunk-side of the network and thus ruins Verizon=s own plan for congestion relief. The OCA supports NHISPA=s request that Verizon refund any termination liabilities paid by ISPs participating in this docket. The OCA also supports NHISPA=s proposal that Verizon offer a dry copper tariff, at favorable rates to encourage migration from the PSTN.

The OCA supports NHISPA=s request for docket expense recoupment under RSA 365:38-a. In the OCA=s view, recoupment will encourage voluntary participation by such interest groups.

F. Staff

Beginning in February 1998, Staff worked with Verizon to improve congestion via load balancing and line unit addition based on a monthly report of the ten most congested COs. Although some improvement ensued, customer complaints increased in February 1999 to the point where it became necessary to open this docket. Although Staff considered that Verizon=s proposed five-prong plan to address the continuing problem would be effective, subsequent data proved otherwise. Staff presented graphs tracking the performance data for the ten most congested COs during the last 27 months, arguing that the data supports a

conclusion that Verizon's efforts, to date, have not sufficiently relieved congestion. The data also showed that congestion is dramatically relieved when ISPs move from line-side to trunk-side services.

The effect of encouraging all ISPs to migrate to trunk-side services may result in congested umbilicals. To address this possible outcome, according to Staff, Verizon can design umbilical capacity based on an assumption that all line-side ISPs will migrate and need umbilical capacity from the remote to the host.

Based on its opinion that Verizon=s efforts to alleviate congestion are not sufficient to remedy the problem, Staff recommends that the Commission adopt policies to promote the earliest possible deployment of advanced services by all carriers. Doing so will relieve the PSTN and has the advantage of being proactive rather than merely reactive. Issues raised by Verizon=s pending divestiture of its advanced services portion of its network equipment and business will be best considered in the pending docket DT 00-185.

In Staff=s view, actions necessary to achieve the goal of advanced services deployment include the following. (1) Termination liability associated with ISP Centrex contracts with Verizon should be reduced, rather than eliminated, utilizing the

formula developed in the Fresh Look docket DT 96-240, Order No. 22,798. By instituting this formula, Verizon could preserve the benefit of its bargain and the ISP could better afford its obligation. (2) An additional reporting requirement on umbilical blocking should be imposed on Verizon, enabling better monitoring of congestion as ISPs migrate to the trunk-side. (3) The Commission should consider requiring Verizon to increase its DSL product offerings in congested COs or requiring Verizon to offer dry copper in those COs. (4) ISPs ordering from Verizon should identify the intended use for the lines, i.e. Internet access. Verizon can thus track impending congestion. (5) The total number of lines an ISP possesses in one central office should be limited, grandfathering existing lines. And (6), for the month following a CO's inclusion on the ten-most-congested-CO report, and any time a CO experiences recurring congestion for multiple months despite efforts to add capacity, Verizon should be prohibited from selling, in that CO, line-side service to any ISP. Staff argues that these actions will encourage migration of ISPs off the PSTN and, at the same time, discourage ISP expansion on the line-side.

IV. COMMISSION ANALYSIS

Our review of the filings and evidence in this complex matter compels us to recognize the considerable efforts made by ISPs, LECs, the OCA and Staff. We appreciate the attentiveness and persistence demonstrated by all parties and Staff to put forth practical and creative solutions to congestion on the PSTN. In response, we will exercise equal diligence to monitor and assess the effects of efforts to implement solutions. We recognize the importance of balancing the claims and interests of consumers, incumbents, new entrants, and correlated businesses in the communications world where the only constant is change.

The TAct established a public policy priority to preserve a vibrant free market for the Internet, Aunfettered by Federal or State regulation.@ 47 U.S.C.A. '230(b)(2). That priority was affirmed by the FCC in its order on access charge reform,[3] in which it again included ISPs in its policy of exempting enhanced service providers (ESPs) from paying interstate access charges.

In a 1998 law review article, economists dispute the wisdom of allowing ISPs to avoid paying for interstate access,

[3] Access Charge Reform, Price Cap Performance Review for Local Exchange Carriers, Transport Rate Structure and Pricing, End User Common Line Charges, *First Report and Order*, CC Docket Nos. 96-262, 94-1, 91-213, 95-72, 12 F.C.C.R. 15,982, 16,131-35 **&&** 341-48 (1997)

despite agreeing that the dramatic growth of the Internet creates significant benefits for the American economy, because the ESP exemption creates another public policy concern over congestion of the PSTN.[4] Our policy goal is to relieve congestion which jeopardizes the PSTN=s reliable performance thereby creating risks to public safety. We find that the evidence presented supports a conclusion that migration of ISP traffic to the trunk-side of the switch relieves congestion as it exists today and that migration of Internet traffic off of the PSTN altogether will prevent additional congestion. Accordingly, we will take actions to facilitate both kinds of migration.

Termination of ISP Contracts

In the short term, we are convinced that ISPs will migrate off the line-side of the PSTN if they are released from the burden of paying the Schedule A charges included in their Centrex contracts with Verizon. We disagree with Verizon's characterization of these charges and find that the Schedule A charges act as a termination fee, an amount due when the ISP terminates its contract prior to the contracted-for end date. Here, ISPs trigger the Schedule A charges when they migrate off

[4] Sidnak and Spulber, *Cyberjam: The Law and Economics of Internet Congestion of the Telephone Network*, Harvard Journal of Law and Public Policy, p. 327-394 (Spring, 1998). According to the article, access should be priced efficiently, sending the correct signals so consumers would make efficient demand decisions, and there would be incentives for supplying greater capacity and for choosing the best transmission technologies.

the congested side of the network. The Schedule A charges, combined with the added expenses of equipment and labor to make their services operable on the trunk-side of the network, deter the ISPs from taking this step that has been demonstrated to relieve network congestion. We find that Verizon=s Centrex facilities being in demand on the congested network, and therefore will not likely become stranded investment. The lines will be used and revenues continue to flow to Verizon. Thus, Verizon will not be harmed financially and the New Hampshire public will benefit from the effect of releasing ISPs from the Schedule A obligation in exchange for removing their access services from the line side of the switch.

In arriving at the conclusion that ISPs that migrate from the line-side of the network should be forgiven any Schedule A charges remaining, we considered the relative costs and benefits involved in various decisions. For instance, the estimated costs to Verizon of forgiving Schedule A charges can be compared to the costs to Verizon of increased investments in new line units. The costs of each of those actions must be weighed against the amount of congestion relief that is obtained and the finality of that relief. Forgiveness of Schedule A charges shall be limited to those ISPs that actually migrate off the line-side of a Verizon switch, thereby relieving some

congestion or potential future congestion and simultaneously limiting Verizon's costs. Furthermore, we will limit the forgiveness of Schedule A charges to existing contracts: ISPs that enter Centrex contracts with Verizon after the date of this order shall not be eligible to receive Schedule A charge forgiveness even if they later migrate to the trunk-side.

RSA 378:7 authorizes the Commission to modify rates at any time to ensure protection of the public interest. Our decision in *Re Freedom Ring,* 82 NH PUC 833 (1997) thoroughly analyzes the scope of that express authority and implied authority in light of the *Mobile-Sierra* doctrine[5] as well as the police power exception to the Contract Clause in the U.S. Constitution, Article I, '10 and the equivalent clause in the New Hampshire Constitution. In *Freedom Ring*, we permitted a limited opportunity for customers under long-term contracts with Bell Atlantic to terminate those contracts early and pay reduced termination penalties, based upon the strong public interest in telecommunications competition as articulated in the TAct. Although the extensive rationale laid out in Freedom Ring

[5] The *Mobile-Sierra* doctrine is based on the United States Supreme Court=s holdings in *United States Gas Pipeline Co. v. Mobile Gas Service Corp.* 350 U.S. 332 (1956) and *FPC v. Sierra Power Co.*, 350 U.S. 348 (1956). The doctrine permits contractually based tariffs to be set aside by a regulatory agency if the agency later finds that the rate is contrary to the public interest because the agency=s statutory authority to modify unjust rates gives it continuing jurisdiction over the rate. The Commission first applied the *Mobile-Sierra* doctrine in Town of Derry, 77 NH PUC 4 (1992).

buttresses our analysis here, it is not required. The public interest referred to in RSA 378:7 is evident in this case. Public safety requires a reliable PSTN and our limited modification of the tariff for Centrex is a cost-effective way to enhance that reliability. Verizon=s failed argument in *Freedom Ring*, that the authority granted to the Commission to modify rates in RSA 378:7 does not extend to the modification of the terms of existing contracts approved by the Commission, fails here as well. AContracts remain fully subject to the paramount power of the Commission to modify them when necessary in the public interest.@ *Freedom Ring* at 842, citing *Mississippi Indus. V. FERC*, 808 F.2d 1525 (D.C.Circ.) *cert. denied* 484 U.S. 985 (1987).

In *Freedom Ring*, we balanced the public benefit of competition against Verizon's right to obtain the benefit of its bargain. We concluded that Verizon should retain a portion of its bargain, that is, a portion of its Schedule A charges. We therefore devised a formula for determining an appropriate reduction and applied it in each individual case. Here, the same charges apply. However, because public safety is the issue at stake, Verizon=s investment will not be stranded, and the opportunity is limited to ISPs actually moving off the line-side of the network, and there is a possibility that Verizon will

expend fewer resources on line units, we find that a full waiver of the charges is appropriate for current ISP customers. Less than a full waiver of the charges may not provide an attractive enough incentive to create the diminution of congestion we seek in the public interest.

We will not compel Verizon to return Schedule A payments to ISPs that terminated their contracts with Verizon prior to this order. Although NHISPA characterizes such an action as reparations, we cannot conclude that Verizon should be penalized for implementing tariffed rates. We are acting here to address a threat to public safety, not to identify and redress wrongdoing. Furthermore, while RSA 378:7 authorizes us to modify rates to ensure protection of the public interest, we typically implement rate changes prospectively. In addition, the past business decisions of ISPs are not open to our analysis.

Dry Copper

NHISPA posits that network congestion can be effectively addressed by requiring Verizon to offer a retail tariff for twisted copper loops devoid of load coils, bridged taps and other devices that aid in the provision of voice service but interfere with data service. Because much of today=s twisted copper wire contains bridged taps, etc., it must

be conditioned by stripping off such common accessories. Conditioning copper is a task that can be time-consuming. A tariff for dry, e.g. conditioned, copper would permit ISPs to provide DSL or a similar advanced service to internet users utilizing Verizon=s technicians at Verizon=s CO to tie together one dry copper loop coming from the ISP and one dry copper loop coming from the internet user. The dry copper would utilize neither the line-side nor the trunk-side of the PTSN.

At hearing, Verizon testified that providing dry copper is technically feasible. Apparently, Verizon currently offers BANA, a burglar alarm service, over copper that is dry. Used for alarm purposes, BANA does not interfere with T-1 signals. However, BANA is only for short distances and is not always devoid of load coils and bridged taps. Beyond eight to ten thousand feet it must be conditioned, at a cost. ISPs want guaranteed conditioned copper for longer distances and intend to use it to provide DSL. DSL can create spectrum interference with T-1 circuits that are in the same cable.

As in the issue of termination charges, our approach is one of balancing the costs and benefits of this proposed solution to network congestion. Unlike the conclusion with regard to termination charges, we are not convinced that the costs of providing dry copper are justified by the benefit

gained. The deployment of a dry copper companion network may have the effect of removing ISPs= Internet users from the PSTN for data usage. However, those consumers will remain on the PSTN for their regular telephone service. Thus, each of those consumers will require two copper loops for Internet service and one copper loop for POTS service. Currently, we do not know the cost of conditioning the dry copper loops and therefore do not know whether the retail price of dry copper would be low enough for ISPs to provision a resonably priced DSL service. Because Verizon provides T-1 service, which may experience interference when residing in the same cable as DSL provided by ISPs, in order to maintain a reliable network Verizon will be constrained to track the whereabouts and identity of its own T-1 and the dry copper it sells, as well as the use to which the dry copper is put. Otherwise, consumers of T-1 data services may likely suffer.

We recognize that there are costs of provisioning dry copper. Depending on the results of a quantification and analysis of those costs, however, dry copper remains a possible option for relieving the threat to public safety posed by network congestion. Therefore, we will instruct Verizon to file an illustrative tariff within 30 days of this order. We will instruct our Staff to analyze the illustrative tariff in terms

of the costs and benefits regarding network congestion relief. For instance, we will consider the incremental cost of the solution in comparison with the incremental cost of line unit installation, etc. We intend to issue a supplemental order detailing our reasons for accepting or rejecting a dry copper tariff as a network congestion solution.

Vitts argument that dry copper is merely an unbundled network element that is conditioned presents a knottier issue, addressed in the next section below.

Loop Conditioning Costs

One solution to the issue in this docket, network congestion relief, involves moving advanced data services off of the PSTN. We will achieve that solution to some extent by means of eliminating financial barriers and investigating the viability of a dry copper tariff. Vitts proposes a method to promote CLEC deployment of DSL by removing Verizons loop conditioning costs to CLECs. The high cost of loop conditioning must be passed on to CLEC customers, making the CLEC product unattractive to consumers and limiting CLEC xDSL deployment.

Loop conditioning, as all parties concede, requires labor and time. The issue of loop conditioning charges is poised for resolution in Docket No. 97-171, Verizons SGAT filing. We have been working on that docket and expect to issue

an order soon. Given this, we will not rule on loop conditioning costs in this order.

Distance Requirement

From the record in this docket, we understand that Verizon does not have the capability to provision xDSL to its customers beyond 18,000 feet from the CO. We also understand that some CLECs do have that capability, could they but purchase the xDSL loops from Verizon. We find that Verizon=s arbitrary distance limitation in its current tariff serves as an unreasonable inhibition to the provision of new services for New Hampshire consumers. Verizon is not permitted to tie its competitors to its own limitations. Furthermore, we are aware that by letter dated November 15, 2000, Verizon signaled its intention to revise the New Hampshire SGAT to remove specific transmission speeds and delete references to minimum loop lengths. We will require Verizon to remove that limitation immediately.

Loop Qualification Fees

Loop Qualification charges, like conditioning charges, are incurred by Verizon to determine whether a particular loop meets the particular technical specifications necessary to support a service like DSL. In effect, loop qualification is insurance that a proposed new service will not interfere with

other consumer's use of the network. The particular technical specifications may change over time. If a purchaser chooses not to have a loop qualified, as happens apparently with BANA, the purchaser risks buying a loop that is not satisfactory. Regardless, the choice is the purchaser:s. We do not see a strong correlation to reducing congestion on the network. Moreover, this issue is appropriately positioned for action in Docket No. 97-171.

Plug and Play (NGDLC)

The possibility of Plug and Play as a tool for dealing with congestion was raised for the first time in Vitts' brief. From Vitts' quick summary of the process we understand that a CLEC would provide Verizon with an electronic card for use in Verizon's equipment. While there is not enough information on the record in this docket, we will explore this option in the VAD docket, DT 00-185 and DT 00-071. As part of that docket we will determine, for instance, whether Verizon has compatible digital loop concentrators to make the CLEC's xDSL cards useable, and how this is comparable to collocation, virtual or physical. We will not rule on Plug and Play in this order.

Service Quality Standards

The OCA would have us impose stringent new reporting requirements on Verizon, recounting worst day details by wire center, ISP movement tracking, switch identification, and trouble reports directly to the Commission to corroborate Verizon reports. The OCA doubts that Verizon can define and anticipate congestion adequately enough to protect the public. We appreciate the OCA=s concern. Nonetheless, we find that most of the additional reports suggested do not provide information that is more useful than the reports currently required. Recent experience discerns that Verizon=s new diagnostic tool has been helpful; and the kind of supervision proposed by the OCA moves significantly toward micromanagement which the Commission believes is inappropriate here. Inasmuch as the possibility of umbilical blocking arises with more and more data traffic migrating to the trunk-side of the network, we will require Verizon to file monthly umbilical busy hour reports. In addition, we will require Verizon to provide monthly reports of the number of ISP lines migrating to the trunk-side as a result of our decision to eliminate Schedule A charges for ISPs.

The OCA also proposes a system of automatic fines and penalties as incentive for meeting quality standards and deterrent from neglecting the infrastructure. We do not agree. The Commission has found that any system of financial penalties

for specific infractions encourages businesses to measure their potential losses and make judgments accordingly. The possibility arises that a company can Abuy its way out@ of quality standards. We believe that the threat of Commission investigation and remediation acts as a better deterrent and decline to initiate at this time the prescribed penalties recommended by the OCA.

Effective Planning Actions

In order to deal effectively with congestion caused by the changing usage of the line-side of the network, we will require ISPs to identify the use intended for line-side services they order from Verizon. Verizon shall ask, at the time an order is placed, whether the line will be used by an ISP for Internet access. Verizon will thus be better informed about possible congested areas and will take the necessary actions to avoid or mitigate it. In addition we approve the proposal that ISPs= total number of lines held at one time per CO should be limited. Therefore, with a grandfathering exception for existing lines over the limit, we will place a limit on the number of lines an ISP can occupy in a particular CO. We will give parties 30 days from the date of this order to submit recommendations on the maximum number of lines which terminate in the line units in a CO, an ISP should be allowed to occupy.

Verizon shall refuse to sell additional line-side services to ISPs already holding more than the maximum number of lines. Furthermore, Verizon shall refuse to sell additional line-side resources for Internet access to ISPs for any CO during the month after which the CO appears on the Commission=s 10 Most Congested COs report.

Litigation Expenses Requested by NHISPA

RSA 365:38-a provides, in pertinent part:

> The commission may allow recovery of costs associated with utility proceedings before the commission, provided that recovery of costs for utilities and other parties shall be just and reasonable and in the public interest. For purposes of this section, other parties shall be defined as retail customers that are subject to the rates of the utility and who demonstrate financial hardship; ...Recovery by other parties shall be deemed to be in the public interest when, in any commission proceeding, the other party substantially contributes to the adoption by the commission, in whole or in part, of a position advocated by the other party in that proceeding or in a judicial review of that proceeding or in a judicial review of that proceeding. If an award of costs is granted in a proceeding other than one involving a change in a utility=s rates, the entire amount of the award shall be immediately recovered by the utility through measures approved on a timely basis by the commission.

Other than to indicate our intention to consider these questions at the proper time, however, we make no judgment as to the merits of NHISPA's request. In light of reference in the statute to "judicial proceeding", we will hold the issue of any

and all requests for compensation in abeyance until the appeal period expires or any judicial review has been completed.

Verizon's Plan for the PSTN

The OCA argued that Verizon should ensure the continued integrity of the PSTN by preparing and submitting an agressive short-term and long-term plan. At this point, we will not require submission of a formal plan. We believe that the actions prescribed in this order are reasonable next steps. They constitute the combined efforts of the ILEC, ISPs, CLECs, and regulators. Greater monitoring and sensitivity to the increasing demands for data services, and the new responsibilities created herein, will enable all stakeholders to contribute to the safe evolution of communications in New Hampshire.

Based upon the foregoing, it is hereby

ORDERED, that Verizon shall waive any Schedule A charges due and owing from an ISP that terminates its contract with Verizon for the purpose of migrating from the line-side of the network; and it is

FURTHER ORDERED, that the waiver granted pursuant to the first ordering clause above shall apply prospectively only; and it is

FURTHER ORDERED, that the waiver granted pursuant to the first ordering clause above shall apply to line-side contracts, through either tariff or special contracts, in existence at the time this order issues; and it is

FURTHER ORDERED, that Verizon shall file with the Commission within 30 days of the issuance of this order an illustrative tariff for the provision of dry copper as discussed in this order, including pricing with cost support; and it is

FURTHER ORDERED, that the Commission Staff shall perform and submit to the Commission a cost-benefit analysis of the illustrative tariff within 30 days of its submission by Verizon; and it is

FURTHER ORDERED, that Verizon shall remove any minimum loop length requirements for the provision of of xDSL to CLECs from its

FURTHER ORDERED, that Verizon shall include data on umbilical busy hours and the number of lines which migrate to the trunk-side in its monthly reports to the Commission on congestion,; and it is

FURTHER ORDERED, that Verizon shall ask for and ISPs shall provide, ***ab initio*** at the time of ordering, information as to the purpose for which line-side resources are intended; and it is

FURTHER ORDERED, that, within 30 days from the date of this order, with the exception of currently held lines which shall be grandfathered as lawful, any party may file a recommendation on the maximum number of line side terminations an ISP shall be permitted in a particular CO at any given time, with the exception of currently held, and it is

FURTHER ORDERED, that within 30 days from the date of this order Verizon shall file a compliance tariff comporting with the requirements of this order.

By order of the Public Utilities Commission of New Hampshire this twenty-ninth day of March, 2001.

Douglas L. Patch Chairman	Susan S. Geiger Commissioner	Nancy Brockway Commissioner

Attested by:

Thomas B. Getz
Executive Director and Secretary