BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

IN THE MATTER OF THE CONTINUED COSTING AND PRICING OF UNBUNDLED NETWORK ELEMENTS AND TRANSPORT AND TERMINATION	Docket No. UT-003013

RESPONSE TESTIMONY OF MICHAEL ZULEVIC

ON BEHALF OF COVAD COMMUNICATIONS COMPANY AND RHYTHMS NETCONNECTIONS, INC.

July 21, 2000

Q. PLEASE INTRODUCE YOURSELF.

A. My name is Michael Zulevic. I am the Director of Network Deployment, Special Initiatives. In that capacity, I am responsible for the design of Covad's line sharing architecture, the negotiation of line sharing agreements to implement that design and the deployment of Covad's national line sharing network.

Q. ARE YOU THE SAME MICHAEL ZULEVIC WHO FILED DIRECT TESTIMONY ON MAY 19, 2000?

A. Yes I am. However, my title and job responsibilities have changed since I filed that testimony. As reflected in my introduction, I am no longer responsible for the deployment of Covad's xDSL network throughout our central region. Instead, I have national responsibility for network deployment of special projects, including line sharing.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my Rebuttal Testimony is to respond to Mr. Hubbard's testimony by describing the proper network configurations for xDSL and line sharing in a forward-looking central office so that the Commission can set proper pricing for collocation and line sharing in Washington. My testimony also supports the recommendations that John Klick will make for the Commission's approach to these issues. As part of this discussion, my testimony will describe three different splitter collocation configurations: splitter collocation at the main distribution frame ("MDF"), splitter collocation on a relay rack efficiently located adjacent to the MDF, and splitter collocation in a CLEC's physical collocation space. In each of these collocation scenarios, I have assumed line sharing is provided in 96-line increments.

Q. BASED ON YOUR YEARS OF EXPERIENCE WORKING IN U S WEST CENTRAL OFFICES, HOW WOULD YOU DESIGN A FORWARD LOOKING CENTRAL OFFICE?

A. A forward-looking central office would have at least three characteristics. First, as a wholesaler, I would design the office to support many users and a variety of telecommunications services. Second, my forward looking central office would be designed to accommodate the capabilities and limitations of the various services that are

offered from it. Third, my forward looking central office would use the most efficient available equipment so that I could reduce costs to myself and my customers.

To meet the first criteria, I would equip my central office with a main distribution frame (MDF) for the termination of loops coming from the outside plant and the distribution of the loops to the switch, other office equipment or my wholesale customers. I also would provide a menu of options for the wholesale collocation of equipment, including both caged and cageless collocation.

To meet the second criteria, I would locate and collocate all xDSL equipment within 25 feet of the distribution frame. All current xDSL technologies (except for IDSL) are distance limited. The service simply will not work more than 18,000 feet from the Digital Subscriber Line Access Multiplexer (DSLAM) that generates the DSL signal. That means that every foot of unnecessary cabling in the central office reduces the effective reach of xDSL services by one foot outside the central office. For line sharing, this also means that the splitter should be placed either on the frame or as close as possible to it.

The third criteria is really solved, given existing technology, by using the MDF.

Q. PLEASE DESCRIBE THE FIRST SPLITTER COLLOCATION CONFIGURATION.

A. The first collocation option is to place the splitter on the incumbent local exchange carrier's ("ILEC") distribution frame. For the purposes of this discussion, I am going to refer to main distribution frames or MDFs. As discussed below, however, the concept would be the same whether the ILEC uses an MDF or a COSMIC frame. To accommodate 96 lines on a frame, the CLEC would be required to collocate six frame-mountable splitter blocks (each "splitter block" capable of serving sixteen lines) on the

horizontal side of the MDF ("HMDF"). In this installation, the data terminals on the splitter block would be cabled, or hardwired, directly to the digital subscriber line access multiplexer ("DSLAM") in the CLEC collocation area. Attachment A to this Rebuttal Testimony is a graphical depiction of this collocation arrangement.

To deliver a loop for line sharing under this network configuration, QWEST first would need to disconnect the cable pair jumper wire (also known as a cross-connect) that connected the original plain old telephone service ("POTS") line from its termination on the vertical side of the MDF ("VMDF") to the horizontal terminal block that corresponds to the voice switch. QWEST would then reconnect that jumper to the data/voice terminal on the splitter block. Then QWEST would connect another jumper wire between the voice terminal on the splitter block and the ILEC switching equipment terminal block.

Q. HOW MANY FRAME BLOCKS AND TIE CABLES ARE REQUIRED FOR SPLITTER COLLOCATION IN THIS CONFIGURATION?

A. Because the splitter mounts on the frame like a block, no additional frame blocks are required. One 100 pair tie cable is required to connect the data ports on the splitters to the CLEC's DSLAM.

Q. PLEASE DESCRIBE THE SECOND SPLITTER COLLOCATION CONFIGURATION.

A. The second option is to place the splitter on a relay rack adjacent to QWEST's MDF. In an efficient, forward-looking central office, the relay rack would most likely be located within 25 feet of the MDF. These splitter shelves typically provide capacity for 96 voice lines, and only one rack-mounted splitter would be required per installation. The splitter's voice/data and voice ports would be cabled directly to terminal blocks on the HMDF. The splitter's data port would be cabled directly to the CLEC's collocation area. Attachment B to this Rebuttal Testimony is a graphical depiction of this architecture.

To deliver a loop for line sharing in this network configuration, the installation would be

identical to the installation for a frame mountable splitter, except that the jumper wires would be connected to connecting blocks on the horizontal side of the MDF instead of a splitter block.

Q. HOW MANY FRAME BLOCKS AND TIE CABLES ARE REQUIRED FOR SPLITTER COLLOCATION IN THIS CONFIGURATION?

A. This configuration would use two blocks on the distribution frame and three 100 pair tie cables. The first tie cable carries the voice and data traffic between the distribution frame and the splitter. The second carries the voice traffic between the distribution frame and the splitter. The third carries the data traffic between the splitter and the DSLAM.

Q. PLEASE DESCRIBE THE THIRD SPLITTER COLLOCATION CONFIGURATION.

A. The third option is for a CLEC to place the splitter within its own physical collocation area. In this scenario, the CLEC is responsible for cabling the data port on the splitter to the CLEC's DSL equipment. The voice/data ports and the voice ports on the splitter would be cabled directly to the connecting blocks located on the HMDF. Attachment C to this Rebuttal Testimony is a graphical depiction of this architecture.

For this configuration, all it will take to deliver a loop for line sharing is the jumper disconnection and two jumper re-connections I described for the installation of a line through a frame mountable splitter. Again, the only difference between this installation and an installation based on a frame mountable splitter is that the jumper wires must be connected to connecting blocks on the horizontal side of the MDF instead of a splitter block.

Q. HOW MANY FRAME BLOCKS AND TIE CABLES ARE REQUIRED FOR SPLITTER COLLOCATION IN THIS CONFIGURATION?

A. This configuration would use two blocks on the distribution frame and two 100 pair tie cables. The first tie cable carries the voice and data traffic between the distribution frame and the CLEC's collocation area. The second carries the voice traffic between the distribution frame and the CLEC's collocation area.

Q. IS IT FEASIBLE TO DEPLOY THE FORWARD-LOOKING NETWORK YOU RECOMMEND IN ILEC CENTRAL OFFICES AS THEY ARE CURRENTLY CONFIGURED?

A. Yes. Cageless collocation, when properly implemented by an ILEC on a non-discriminatory basis should easily permit the ILEC, on average, to get CLEC and ILEC DSL equipment within 25 feet of the distribution frame.

Q. WHY IS THAT?

A. Central offices are arranged so that long rows of relay racks/bay are installed parallel to the distribution frame. In any given central office there will be between six and eight rows of relay racks within 25 feet of the frame. When ILECs intermingle cageless collocation arrangements for xDSL equipment in existing line ups rather than segregating that equipment, all of the xDSL equipment can easily be placed within that distance.

Q. CAN THE CONFIGURATION YOU PROPOSE, WHERE THE SPLITTER IS CABLED DIRECTLY TO THE DISTRIBUTION FRAME, WORK IN A CENTRAL OFFICE THAT USES A COSMIC FRAME?

A. Yes. Because they are built primarily to distribute cable pairs (telephone lines coming from the outside plant) to the voice switch in a single carrier environment, COSMIC frames, as they are currently configured and used by ILECs, are not forward looking or efficient in a multi-carrier competitive environment. It is technically feasible, however, to configure the COSMIC frame so that loops coming from the outside plant can be cross-connected to tie pair cross-connect panels for miscellaneous equipment. Those cross-

connect panels exist on every COSMIC, and the tie cables that extend between a splitter or other CLEC equipment and the COSMIC frame could terminate on them. These cross-connect panels could easily be dedicated to specific CLECs and their equipment. At that point, the COSMIC becomes analogous to an MDF in terms of its ability to distribute loops to other carriers.

Q. WHY DON'T THE CONFIGURATIONS YOU PROPOSE USE THE INTERMEDIATE DISTRIBUTION FRAME REFERRED TO BY MR. HUBBARD?

A. Both intermediate distribution frames (IDFs) and intermediate CLEC or carrier distribution frames (ICDFs) are inefficient and not forward looking for most central offices. The most efficient method of interconnection, as explained above, is directly through an MDF or COSMIC frame. The only exception to that general rule is in very large, multi-floor central offices where IDFs are efficiently used to distribute cabling between floors.

Q. WHAT OTHER INFORMATION DID YOU PROVIDE TO MR. KLICK FOR THE DEVELOPMENT OF HIS COST TESTIMONY?

A. First, I explained to Mr. Klick that a relay rack should be configured to hold at least 12 splitter shelves per relay rack. This is based on my experience working in a central office for many years and as the Director of Network Deployment for Covad over the past two years. In addition, my proposal that 12 splitters be installed per bay is a conservative one. A standard 7 foot relay rack provides 43 mounting plates of space. Each splitter shelf requires 3 mounting plates. Therefore, 14 splitter shelves can be installed in the same bay. Bell Atlantic, in fact, has publicly announced plans to install 14 splitter shelves in a standard relay rack. Attachment D to this Rebuttal Testimony is an excerpt from Bell Atlantic workpapers describing this configuration.

Second, I provided Mr. Klick information relating to the manpower requirements for splitter collocation under each configuration.

Q. WHAT ARE THE MANPOWER REQUIREMENTS FOR PLANNING AND ENGINEERING ASSOCIATED WITH SPLITTER COLLOCATION IN THE THREE COLLOCATION CONFIGURATIONS DESCRIBED ABOVE?

A. At the request of Mr. Klick, I prepared a table summarizing what I believe are the manpower requirements for planning and engineering each of the three forms of splitter collocation. The values set forth in each column represent the number of hours for each function.

Function	MDF Splitter Collocation	Common Area Splitter Collocation		Splitter in CLEC Collocation Space
		Splitter	Relay Rack	
Outside Plant Access Design	0	0	0	0
MDF Planning	2	1	0	1
Overhead Rack Planning	1	1	0	1
Power Engineer	0	0	0	0
Equipment Engineer	3	1	3	0
Equip. Installation Project Manager	2	1	1	1
Operations Group	2	1	1	1
ILEC Contact Group	1	1	0	1
Other ILEC Groups	1	1	0	1

The manpower requirements in this table are based on my experience with line sharing and my familiarity with installing equipment in ILEC central offices. In all three collocations scenarios, the ILEC must first determine where to place the splitters on the distribution frame, and second, determine the most efficient way to route the tie cables between the distribution frame and the CLEC's collocation area. For splitter collocation in a common splitter area adjacent to the MDF, the ILEC must also plan for the relay rack.

Q. WHAT WORK IS REQUIRED TO PLACE THE SPLITTER?

A. As reflected in the table above, the amount of work required to place a splitter is minimal. I have attached, as Attachment E to this Rebuttal Testimony, documentation from SIECOR regarding their splitters. As the Commission can see from this attachment, installation of the splitter is a simple task requiring screwing the splitter into an existing

frame block or relay rack shelf. These splitters would be purchased fully equipped with line cards, so no additional line card installation is required. In addition, the tie cables required for the splitters are connectorized and simply plug into the splitter, much as a printer cable plugs into a computer. As such, almost all of the manpower requirements are associated with contact time between the CLEC and ILEC, choosing which location to install the splitter and determining the routing of the tie cables between the distribution frame, splitter and collocation area.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes it does.