

GOVERNMENT OF THE VIRGIN ISLANDS
OF THE UNITED STATES

Public Services Commission

In Re:)
)
 INVESTIGATION OF RATES OF) PSC Docket No. 578
 VIRGIN ISLANDS TELEPHONE)
 CORPORATION d/b/a INNOVATIVE)
 COMMUNICATIONS)

PRE-FILED DIRECT TESTIMONY OF W. KEITH MILNER

J'Ada Finch-Sheen
Innovative Communications Corp.
Innovative Business Center
4006 Estate Diamond
Christiansted, St. Croix
U.S. Virgin Islands 00820
(340) 777-7700

Bennett L. Ross
Suzzette Rodriguez Hurley
Wiley Rein LLP
1776 K Street, N.W.
Washington, DC 20006
(202) 719-7000

September 26, 2008

Attorneys for Virgin Islands
Telephone Corporation

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

VIRGIN ISLANDS TELEPHONE COMPANY
DIRECT TESTIMONY OF W. KEITH MILNER
BEFORE THE VIRGIN ISLANDS PUBLIC SERVICES COMMISSION
DOCKET NO. 578
September 26, 2008

Q. PLEASE STATE YOUR NAME AND YOUR BUSINESS ADDRESS,

A. My name is W. Keith Milner. My business address is 2180 Dunwoody Heritage Drive, Atlanta, Georgia 30350.

Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.

A. My telecommunications career spans 38 years and includes management responsibilities in the areas of network planning, engineering, training, administration, network operations and regulatory planning and operations. I have held positions of responsibility with a local exchange telephone company, a long distance company, and a research and development company. I have extensive experience in all phases of telecommunications network planning, deployment, and operations in both the domestic and international arenas. Prior to my retirement from AT&T in May 2008, I led a team handling all wholesale customer negotiations, regulatory support, contract management, industry relations and merger conditions compliance within AT&T's 22-state wholesale customer segment. Prior to the completion of the AT&T/BellSouth merger, I held a similar position within BellSouth's

1 Business Markets Group, plus I was responsible for alliance management for
2 BellSouth's strategic suppliers across BellSouth's nine-state region.

3

4 I graduated from Fayetteville Technical Institute in Fayetteville, North
5 Carolina, in 1970, with an Associate of Applied Science in Business
6 Administration degree. I graduated from Georgia State University in 1992
7 with a Master of Business Administration degree.

8

9 A copy of my resume is attached to this testimony as Exhibit WKM-1.

10

11 Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE ANY PUBLIC
12 SERVICE COMMISSION?

13

14 A. Yes. I have testified before the state Public Service Commissions in
15 Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, and South
16 Carolina, the Tennessee Regulatory Authority, and the North Carolina
17 Utilities Commission on issues of technical capabilities of network facilities,
18 the introduction of new service offerings, expanded calling areas, unbundling
19 of network facilities, and network interconnection. I have also testified before
20 the Federal Communications Commission on similar matters.

21

22

23 Q. HOW IS YOUR TESTIMONY ARRANGED?

24

25 A. My testimony is divided into the following sections:

1 Part A is an Executive Summary that contains an overview of the goals of a
2 network inspection I conducted of VITELCO's¹ facilities in September 2008
3 and describes the manner in which the inspection was conducted, including
4 the evaluative criteria used to assess the current condition of VITELCO's
5 network assets.

6
7 Part B contains a discussion of the condition of VITELCO's major network
8 assets and the results of the network inspection I conducted.

9
10 Part C summarizes the results of the individual inspections conducted and
11 provides general conclusions regarding the overall state of VITELCO's
12 network.

13
14 Part D contains a discussion of VITELCO's current customer service and
15 feature capabilities based on the capabilities of its network and compares
16 those limited capabilities to those typically available from local service
17 providers on the mainland.

18
19 **PART A: EXECUTIVE SUMMARY**

20 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

21

22 A. The purpose of my testimony is to present an objective assessment of the
23 current state of VITELCO's network assets and capabilities. This assessment

¹ Virgin Islands Telephone Company does business as Innovative Telephone Corporation. For ease of reference this Report will use the term "VITELCO" to refer to the legal entity owning and operating network assets to provide customers with telephone and Internet access services.

1 is based on personal observations I have made of VITELCO's primary
2 network assets coupled with my experience and background in
3 telecommunications network architecture, planning, engineering, and
4 operations.

5
6 Q. HOW IS THE NETWORK ARCHITECTURE OF VITELCO'S NETWORK
7 DIFFERENT FROM OTHER NETWORKS IN THE U.S.?

8
9 A. In many regards, the underlying architecture of VITELCO's network is very
10 similar to other local service providers' networks. Most use centralized
11 switching systems to interconnect callers to each other or to other carriers'
12 networks including long distance service providers. Customers gain access to
13 the switching systems primarily in two ways: either via "all copper" loops
14 extending from the customers' premises to the switching system or via copper
15 loop distribution facilities (sometimes referred to as "last mile" components)
16 which are in turn connected to electronic devices that convert analog signals
17 to digital signals for conveyance forward to the switching systems. Of course,
18 the topography of the area served (mountainous versus flat, for example) and
19 the amount of customer dispersion (that is, the density or clustering of
20 customers in particular areas) influences choices of particular serving
21 arrangements and also influences choices regarding one manufacturer's
22 products over another manufacturer's products.

23
24 However, at the same time, VITELCO's network is seriously outdated; newer
25 technology that is common in almost every telecommunications network on

1 the mainland is virtually absent from VITELCO's network. The failure to
2 incorporate such technology –including soft switches, Internet Protocol (IP)
3 transport capabilities and the like – limits the services VITELCO can offer its
4 customers and prevents VITELCO from taking advantage of network
5 efficiencies that other carriers currently enjoy.

6

7 Q. WHAT WILL YOUR TESTIMONY DEMONSTRATE?

8

9 A. My testimony will demonstrate that VITELCO's network is in a state of
10 disrepair, which adversely impacts customer service in the form of service
11 disruption (that is, loss of service) and service impairment (for example, slow
12 dial tone, noisy or low transmission volumes and the like.) Moreover, I will
13 show that upgrading the network from its current state will not be easy or
14 quick given the pervasive level of deterioration in the network. Finally, my
15 testimony will show that VITELCO's current network architecture and
16 network equipment vintage preclude VITELCO from offering the network-
17 based services commonly available to business customers on the mainland.

18

19 Q. WHAT WAS YOUR ROLE IN CONDUCTING THE INSPECTION OF
20 VITELCO'S NETWORK?

21

22 A. In September 2008, I was engaged to perform a personal inspection of
23 VITELCO's major network facilities on St. John, St. Croix and St. Thomas.
24 Three days were set aside (one day on each island) for this purpose. I chose
25 the sites to be visited and established evaluative criteria.

1 Q. HOW DID YOU PREPARE FOR CONDUCTING THE NETWORK
2 INSPECTION?

3
4 A. I prepared for the inspections and established the schedule based upon my
5 review of network “maps” provided in advance to me by VITELCO
6 personnel. I also reviewed VIPSC’s [Virgin Islands Public Services
7 Commission’s] Relevant Data & Information Regarding an Assessment of
8 Capital Programs dated August 12, 2008. From those maps I determined the
9 major network components that I would visit during the inspection. In this
10 regard, I chose network components that generally serve many customers at
11 once (for example, switching systems or loop electronics) rather than facilities
12 that serve only one or several customers (for example, individual loop “drops”
13 or individual network interface devices which are sometimes referred to as
14 “NIDs”). While it is possible that devices such as loops and NIDs are also in
15 a state of disrepair, even were those devices in perfect condition, customer
16 service would still be subject to degradation when the other, larger network
17 components are deteriorated or malfunctioning.

18
19 Q. PLEASE LIST VITELCO’S PRIMARY NETWORK FACILITIES.

20
21 A. VITELCO’s primary network assets on St. John include:
22 ▪ Remote Switching Center (RSC) equipment at Pastory.
23 ▪ Digital Loop Carrier (DLC) remote terminals at Caneel Bay, Peter
24 Bay, Pastory and Gift Hill.

1 Q. PLEASE DESCRIBE THE MANNER IN WHICH VITELCO SERVES ITS
2 "VOICE ONLY" CUSTOMERS AND ITS "VOICE PLUS DIGITAL
3 SUBSCRIBER LINE (DSL)" CUSTOMERS.

4
5 A. VITELCO's "voice only customers" (that is, those without DSL service) are
6 served in one of two ways. Generally, customers close to the central office
7 switch are served over "all copper" loops extending from the customers'
8 premises to the central office location. Customers more distant from the
9 central office are served via loop distribution facilities extending from
10 customers' premises to loop electronics equipment often described as digital
11 loop carrier (DLC) equipment. The DLC equipment is connected via digital
12 transmission facilities to the central offices and ultimately to the serving
13 switching equipment.

14
15 Customers with Digital Subscriber Line (DSL) service are served via
16 equipment located either at the central office (for those customers relatively
17 close to the central office) or at DLC or other equipment sites. In either
18 scenario, copper loop distribution facilities extend from customers' premises
19 to the DSL equipment where the DSL traffic is separated from voice traffic
20 and is placed over separate transmission facilities to routers and ultimately to
21 the Internet. Voice traffic from customers with DSL service is placed on
22 separate digital transmission paths and is ultimately carried to the central
23 office and the switching equipment therein.

24

1 Q. PLEASE DESCRIBE THE METHODOLOGY USED TO CONDUCT THE
2 NETWORK INSPECTIONS.

3

4 A. On September 10-12, 2008, I made physical inspections of all major network
5 facilities on St. John, St. Croix and St. Thomas. I had unfettered access to not
6 only the equipment locations but also to the “insides” of equipment cabinets
7 and buildings. Equipment cabinets and housings were opened and equipment
8 was inspected for visibly apparent physical deterioration or damage.
9 Functional testing was not performed during the inspection. I evaluated the
10 physical condition of equipment as either “Good”, “Fair” or “Poor” condition.

11

12 Q. PLEASE DESCRIBE THE EVALUATIVE CRITERIA USED IN
13 ASSIGNING A DESIGNATION OF “GOOD”, “FAIR” OR “POOR” TO
14 VITELCO’S NETWORK ASSETS.

15

16 A. “Good” signifies that the equipment appeared in new or almost new condition
17 or that the equipment was free of physical impairment or deterioration.

18

19 At the other end of the scale, “Poor” signifies that equipment had serious
20 service-impacting damage, defect or deterioration. This would include (but
21 not be limited to):

- 22 ▪ Corrosion, rust or debris on connecting blocks.
- 23 ▪ Broken or missing insulators.
- 24 ▪ Jumper congestion.
- 25 ▪ Damaged or missing door or weather seals.

- 1 ▪ Physical damage or loss of structural integrity to cabinets, housings or
- 2 buildings.
- 3 ▪ Blocked or ineffective ventilation or air flow around housed
- 4 equipment.
- 5 ▪ Ill-fitting doors or hatches that don't properly protect the housed
- 6 equipment from weather or physical intrusion.
- 7 ▪ Poor or ineffective record-keeping.

8

9 "Fair" signifies that equipment had only one or two of the types of damage,
10 defect or deterioration noted above.

11

12 Q. DID YOUR INSPECTIONS INCLUDE OBSERVATIONS OF ACTUAL
13 SERVICE QUALITY BEING DELIVERED OVER VITELCO'S
14 NETWORK?

15

16 A. No. The inspection was an assessment of the current physical condition of the
17 network assets and was not intended as an evaluation of customer service
18 levels.

19

20 Q. DO YOU AGREE THAT SERVICE QUALITY AND CONDITION OF
21 NETWORK ASSETS ARE CLOSELY RELATED?

22

23 A. Yes. That has long been my experience. Especially considering the types and
24 frequency of network problems and defects I observed, it is highly probable
25 that the generally poor condition of the network facilities translates directly in

1 many cases to lower levels of service quality. Maintaining even an adequate
2 level of customer services requires that all network elements perform
3 properly. As is true in the old saying that “a chain is only as strong as its
4 weakest link,” any “weak link” in a telecommunications network, (whether it
5 be switching or outside plant equipment or so-called common systems like
6 distributing frames and backup power equipment) will translate to poor
7 customer service. For example, even with switching equipment serving a
8 customer line that is state-of-the-art and in perfect working order, if the loop
9 serving that customer is defective or inoperative, the customer will still
10 encounter poor service in the form of loss of dial tone, noisy transmissions
11 and misrouted calls. VITELCO witness Dr. Jeffrey Eisenach will provide
12 testimony in this proceeding regarding service quality provided to
13 VITELCO’s customers.

14
15
16 **PART B: NETWORK INSPECTION FINDINGS**

17
18 Q. WHAT DID YOUR INSPECTION OF VITELCO’S NETWORK REVEAL?

19
20 A My inspection revealed that VITELCO’s network is seriously outdated and in
21 a state of significant disrepair. My VITELCO Network Inspection Report, a
22 copy of which is attached to my testimony as Exhibit WKM-2, contains the
23 detailed findings of my network inspections, while the remaining part of this
24 section provides a summary of those findings and reaches general conclusions
25 regarding the state of VITELCO’s network.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Q. WHAT DID YOUR INSPECTION REVEAL ABOUT THE CONDITION OF THE SWITCHING EQUIPMENT?

A. All of VITELCO's Nortel switching systems (that is the Host and Remote Switching Centers on all three islands) currently operate using software Generic Release 15. The most current Generic Release provided by Nortel is referred to as Release SN08. The software used by VITELCO is out of date by at least eight (8) major software releases. Because of its being significantly out of date, Nortel will no longer provide higher tiered technical support to VITELCO's maintenance personnel from Nortel's Network Operations Center (NOC). Thus, any software-related problems must be corrected (to the extent possible) by VITELCO's maintenance personnel. This poses two problems. First, such outages could affect most or all customers as software defects or problems potentially affect all customers served from a given host or remote switching system. Second, such problems could result in long customer service outages as VITELCO sought other sources of technical assistance and then marshaled those resources to correct the software problem.

Q. WHAT DID YOUR INSPECTION REVEAL ABOUT THE CONDITION OF VITELCO'S CENTRAL OFFICE BUILDINGS?

A. The Charlotte Amalie central office building housing the switching equipment at St. Thomas showed signs of being significantly compromised. The building

1 is occupied by VITELCO on the second floor and by AT&T on the first floor.
2 The parties share in major expenditures to repair or modernize common areas
3 of the building. Major roof leaks exist at the building. Since VITELCO's
4 switching and other equipment are located on the second floor special,
5 temporary measures are in place to prevent water from reaching and
6 damaging sensitive equipment. A second major defect was identified in the
7 exterior central office walls. The condition is referred to as "spalling," which
8 occurs as the result of water entering brick, concrete or natural stone and
9 forcing the surface to peel, pop out or flake off. Because salt and other
10 minerals are carried in rainwater, the water reacts with the steel reinforcing
11 bars ("rebar") within the poured concrete. Left untreated the rebar rusts and
12 expands, pushing outward from the inside. Eventually, spalling can cause
13 crumbling and destruction of a concrete structure. While I am not a structural
14 engineer, I have noted the condition in other tropical and subtropical climates.

15
16 Serious roof leaking was also observed at VITELCO's site at Tutu on St.
17 Thomas where a warehouse and a maintenance work center are housed in a
18 separate building from the central office building. The warehouse supplies
19 material to maintenance personnel. Roof leaks over the warehouse area and
20 work center area require repair as soon as practical.

21
22 Q. WHAT DID YOUR INSPECTION REVEAL ABOUT THE CONDITION
23 OF VITELCO'S CENTRAL OFFICE EQUIPMENT OTHER THAN ITS
24 SWITCHING EQUIPMENT?

25

1 The Main Distributing Frame (MDF) equipment within the Pastory central
2 office building (at which point connections between outside plant facilities
3 and switching or transmission equipment are made) showed significant levels
4 of “left-in” or “dead” jumpers and general jumper trough congestion. While
5 the MDF within the Pastory central office showed the greatest amounts of
6 jumper congestion, all of VITELCO’s central offices showed at least
7 moderate levels of jumper trough congestion. Unless the unneeded jumpers
8 are routinely removed, the accumulation of jumper wires makes service
9 activation and maintenance more difficult and more time-consuming along
10 with the parallel problems of premature frame exhaust and extended customer
11 service outages.

12
13 Q. WHAT DID THE INSPECTION REVEAL ABOUT THE CONDITION OF
14 VITELCO’S BACKUP POWER GENERATING EQUIPMENT
15 (GENERATORS)?

16
17 A. A backup generator is located at Pastory. At the time of inspection, however
18 the generator was inoperable and was partially disassembled apparently
19 awaiting a decision to either repair or replace the generator. Thus, at the time
20 of inspection, Pastory was without a means of providing customer service
21 beyond the estimated ten-hour life of the on-site batteries should interruption
22 of commercial power occur unless portable generator equipment is available
23 and is brought to the central office.

24

1 The backup generator at Mount Pleasant was likewise inoperable at the time
2 of the inspection. The armature within the generator had been removed,
3 possibly such that it could be re-wound before reinstallation. A portable
4 backup generator was available at the Mount Pleasant site, although the metal
5 housing showed severe corrosion. The top of the structure had completely
6 rusted through in places, and holes of several inches in width were noted thus
7 exposing the generator within to the harmful effects of the weather. It should
8 also be noted that until the permanent generator at Mount Pleasant is repaired
9 and returned to service, the portable generator (which could ordinarily be used
10 to serve another location without a backup generator) must remain at Mount
11 Pleasant.

12
13 Q. WHAT DID THE INSPECTION REVEAL ABOUT THE CONDITION OF
14 VITELCO'S OUTSIDE PLANT FACILITIES?

15
16 A. The vast majority of VITELCO's outside plant facilities show the cumulative
17 effects of lack of routine maintenance and preventative activities. Outside
18 plant cross boxes are generally in poor condition, both in the connector
19 equipment in the cabinets and the cabinets themselves. This is especially
20 problematic give the time, expense and risk to customer service inherent in
21 relocating serving loop facilities from one cross box to another. Pole lines
22 also are in need of general rehabilitation and since the majority of the poles
23 are owned by the Water and Power Authority (WAPA), rehabilitation efforts
24 will be significantly affected by the timing and degree of cooperation
25 achieved.

1 Q. PLEASE DESCRIBE THE OUTSIDE PLANT PROBLEMS YOU
2 OBSERVED.

3

4 A. Outside plant facilities showed a number of different problems common to
5 facilities on all three islands. These problems fall into the following
6 categories:

7

8 Routine inspection and “housekeeping”: As leaves and debris build up
9 around the base of the metal equipment cabinets, corrosion is accelerated due
10 to the interaction of rainwater and the organic material. Such corrosion was
11 noted during the inspection and while not a hazard to customer service at
12 present, without routine inspection and corrective action, debris could
13 accumulate so as to decrease ventilation into the cabinet base (wherein
14 batteries are located) and thereby create a safety hazard.

15

16 Cross-connection box (“cross box”) deterioration: Cross boxes allow field
17 technicians to place, remove and rearrange connections between copper pairs
18 serving customers and associated loop electronics housed in cabinets
19 generally located at the same location. Traffic from customers is digitized
20 and conveyed forward to the switching equipment for further processing. The
21 cross boxes I inspected are of the “screw terminal” variety compared to newer
22 versions which use “punch down” connector blocks. The vast majority of the
23 cross boxes I observed are of this variety and all generally shared the same
24 problems. Insulating plastic around the screw terminals was corroded or
25 missing on most of the connector blocks within the cross boxes, which causes

1 more frequent transmission and noise problems and customer outages.
2 Typically such corroded cross boxes are replaced rather than repaired. This is
3 a time-consuming process as each loop distribution pair served at the location
4 must be relocated one at a time to the replacing equipment. In addition to the
5 time and expense of replacing the cross box, the likelihood of extended
6 customer service problems may be exacerbated by the relatively low quality
7 of customer service assignment records.

8
9 Broken and leaning poles and “double poling”: Numerous broken and leaning
10 poles were noted throughout the network but were especially apparent in the
11 Gift Hill serving area on St. John. Another problem noted was the extensive
12 use of “double poling.” Double poling is a technique where a new pole is
13 erected next to a broken or rotted pole and then facilities are transferred to the
14 new poled and once completed the broken or rotted pole is removed.
15 Significant double poling was noted throughout St. John. A hazard to the
16 facilities exists during the pendency of the double poling and in one observed
17 case the facilities on the new pole were actually helping to secure upright the
18 facilities still attached on the old pole.

19
20 Pole line maintenance: Tree trimming and brush removal activities
21 throughout the islands seemed to have been ignored for years given the
22 amount of accumulation. The failure to trim trees and remove brush poses
23 hazards to aerial facilities from storm activity. Numerous cases also were
24 noted where sagging or broken poles had lowered aerial facilities to the point
25 that passing vehicles could snag and rip down the cables. In routes adjacent

1 to national park land, access to aerial facilities is made even more difficult due
2 to set-back requirements which makes routine tree trimming and brush
3 removal activities even more critical. VITELCO's access to heavy equipment
4 to repair or replace poles is severely limited. For example, VITELCO has only
5 six (6) bucket trucks on St. Thomas which are also used on St. John.
6 VITELCO has one heavy truck on St. Thomas which can be used to transport
7 poles and a second heavy truck with auger on St. Thomas for placing poles.
8 Given the amount of underbrush around and between poles, maintenance
9 personnel are often required to use what limited bucket trucks are available
10 when, if tree trimming and underbrush removal were not a problem, light
11 trucks and equipment could be used instead of bucket trucks to effectuate
12 repairs.

13
14 Q. IN ADDITION TO THE WIDE-SPREAD PROBLEMS THAT YOU
15 DISCUSS ABOVE, WERE THERE OTHER PROBLEMS NOTED?

16
17 A. Yes. Two additional types problem were observed which were especially
18 prevalent on St. Croix and St. Thomas. The first relates to the inappropriate
19 use of so-called Rural C-Wire and Aerial Service Wire (ASW). Many
20 instances were observed in which multiple customers along a given outside
21 plant route are being provided service with so-called C-Wire or ASW instead
22 of higher conductor cables. Rural C-wire is single-conductor pair wire
23 typically used in rural settings. ASW typically contains between two (2) and
24 six (6) conductor pairs but since the wire is used to serve a single customer
25 location, actual practice indicates the use of the smallest size multi-pair wire

1 that would accommodate the customer's service needs. For simplicity, I will
2 refer to both C-Wire and ASW as "ASW." While ASW is often used for
3 service "drops" (the last segment of outside plant attached to a protector
4 device or Network Interface Device (NID) serving a given customer), the
5 problem I observed was that ASW was being used in place of more
6 appropriate multi-pair cables (containing 25, 50, 100 or more conductor
7 pairs). Multiple Aerial Service Wires were observed strung on poles, trees or
8 even lying on the ground raising the risk of service interruption. Especially
9 troubling in one particular observation was that suitable underground ducts
10 and manhole access points were in place (apparently installed at the time of
11 initial roadway construction) that would accommodate multi-pair cables to
12 serve the customers in a more effective manner.

13
14 The second problem deals with older cables referred to as "paper" or "pulp"
15 cables (both of which use paper or paper products to electrically insulate
16 individual conductors from each other) being used extensively in certain areas
17 on the islands. Typically, air pressure systems are used with such outside plant
18 cables. Pressure is maintained inside the cable sheathing at a level higher than
19 atmospheric pressure such that any loss of cable protective sheathing is not
20 met with water intrusion. Water inside the sheathing breaks down the
21 insulating paper or pulp causing the pairs to electrically short, interrupting
22 customer service. The situation I observed is that pressure is maintained only
23 to the point at which the paper or pulp cable is interconnected with so-called
24 PIC cable (Polyethylene Insulated Cable) which does not normally require
25 pressurization due to non-absorbent insulating material being used within the

1 cable sheath. There are instances where the PIC cable is subsequently
2 connected to another section of paper or pulp cable and since this paper or
3 pulp cable is not pressurized, any significant compromising of the cable
4 sheath will result in water intrusion and thus customer service outage.

5

6 Q. WHAT DID THE INSPECTION REVEAL ABOUT THE CONDITION OF
7 VITELCO'S MICROWAVE RADIO FACILITIES?

8

9 A. All inter-island customer traffic is carried over single-hop, dual frequency
10 microwave radio equipment between the Crown Mountain radio site on St.
11 Thomas and radio sites at Pastory on St. John and Christiansted on St. Croix.
12 Disruption of these microwave links would result in disruption of service to
13 all customers except those served by the Host or Remote Switching Centers.
14 Those customers could place calls among themselves but not to customers
15 outside the area served by their particular Host or Remote Switching Center.

16

17 The upper section of the steel tower at the Crown Mountain radio site has
18 been seriously compromised. Although plans are in place to replace that
19 deteriorated section, until the work is completed, there remains a significant
20 risk to inter-island customer service.

21

22 **PART C: SUMMARY OF THE CONDITION OF VITELCO'S MAJOR**
23 **NETWORK ASSETS:**

24

1 Q. WHAT WERE THE OVERALL CONCLUSIONS YOU REACHED AS A
2 RESULT OF YOUR NETWORK INSPECTION?

3
4 A. I visited and inspected 25 of VITELCO's 29 major network facilities sites
5 (86%). These inspected sites represent an even higher percentage of the total
6 customer lines served because, given time limitations available for the
7 inspections, larger sites were inspected instead of smaller sites. Of the 25
8 inspected sites, only one (1) was deemed to be in "Good" condition. That site
9 (the La Vallee DLC site on St. Croix) is relatively new, yet even that site has
10 begun to show some effects of deterioration. Of the remaining sites, 7 of 25
11 (28%) were deemed to be in "Fair" condition and the other 17 of 25 sites
12 (68%) were deemed to be in "Poor" condition. Thus, two thirds of
13 VITELCO's network facilities are in "Poor" condition, while approximately
14 one third of VITELCO's network is in only "Fair" condition. These
15 percentages are reflective of the generally deteriorated and outdated state of
16 the network observed. The table below summarizes the conclusions regarding
17 the state of each network equipment site visited:

| NETWORK FACILITY | OBSERVED CONDITION |
|---|--------------------|
| ST. JOHN | |
| Pastory Remote Switching Center and Digital Loop Carrier | Poor |
| Caneel Bay Digital Loop Carrier | Fair |
| Peter Bay Digital Loop Carrier | Fair |
| Coral Bay Remote Line Concentrating Module | Poor |
| Gift Hill Remote Line Concentrating Module and Digital Loop Carrier | Poor |
| ST. CROIX | |
| Christiansted Host Switching Center | Fair |
| Cotton Valley Remote Switching Center | Fair |
| Sion Farm Remote Switching Center | Poor |
| Mon Bijou Remote Switching Center | Poor |
| Mount Pleasant Remote Switching Center | Poor |
| Airport Remote Switching Center | Poor |
| Frederiksted Remote Switching Center | Poor |
| La Vallee Digital Loop Carrier | Good |
| Ruby Outside Plant Access Cabinet | Poor |
| Catherine's Rest Outside Plant Access Cabinet | Poor |
| Southgate Outside Plant Access Cabinet | Poor |
| St. John Outside Plant Access Cabinet | Not Inspected |
| Hess Oil/Hovensa Outside Plant Access Cabinet | Not Inspected |
| Rattan Digital Loop Carrier | Not Inspected |
| ST. THOMAS | |
| Charlotte Amalie Host Switching Center | Fair |
| Havensight Remote Switching Center | Fair |
| Tutu Remote Switching Center | Poor |
| Nazareth Remote Switching Center | Fair |
| Frenchman's Bay Outside Plant Access Cabinet | Poor |
| Bolongo Bay Outside Plant Access Cabinet | Poor |
| Mountain Top Outside Plant Module | Poor |
| Wintberg Outside Plant Module | Poor |
| Bordeaux Remote Line Concentrating Module | Not Inspected |
| Crown Mountain Radio | Poor |

1 Q. SHOULD NETWORK ASSETS THAT YOU HAVE ASSESSED AS
2 BEING IN "FAIR" CONDITION BE CONSIDERED ADEQUATE?

3

4 A. No, for two reasons. First, even those network facilities that I judged to be in
5 "fair" condition require repair or replacement to eliminate the damage or
6 defect observed and thus return the equipment to a state of being capable of
7 providing reliable, quality customer service. Second, and perhaps even more
8 importantly for the long term, VITELCO's service offerings are at present
9 severely limited by the general network architecture in place and the age and
10 capabilities of the devices deployed in its network. To use an analogy, I could
11 spend a lot of money repairing and rehabilitating my 40 year old car but at the
12 end of that process, I would still have a car with 40 year old technology.

13

14 Q. CAN THE PROBLEMS YOU OBSERVED BE CORRECTED QUICKLY?

15

16 A. No. While it may be possible to correct relatively quickly some of the more
17 minor problems I observed, quick fixes or remediation of the problems I noted
18 generally are not effective in the long run. Temporizing problems (which
19 appears to have been the "norm" of late) will not address the underlying
20 problems, which in many cases can only be corrected by replacing
21 deteriorated or outdated equipment. A programmatic approach towards
22 rehabilitation and modernization is a much better choice, although such a
23 program would necessarily be both expensive and time consuming.

24

1. **PART D: SUMMARY OF NETWORK SERVICE AND FEATURE**
2. **CAPABILITIES**

3
4 Q. IS HAVING A ROBUST OFFERING OF BROADBAND SERVICES
5 IMPORTANT TO VITELCO'S CUSTOMERS?

6
7 A. Yes. The Federal Communications Commission (FCC) explored this topic
8 and reported its findings in Lands of Opportunity: Bringing
9 Telecommunications Services to Rural Communities, (see
10 <http://www.fcc.gov/indians/opportunity.pdf>). According to that report
11 broadband services are important because:

12
13 "Broadband can provide you with the technical capability to access a wide
14 range of resources, services, and products that can enhance your life in a
15 variety of ways. These resources, services, and products include, but are not
16 limited to:

- 17
18 • **Education, Culture, and Entertainment** Broadband can overcome
19 geographical and financial barriers to provide access to a wide range
20 of educational, cultural, and recreational opportunities and resources.
21
22 • **Telehealth and Telemedicine** Broadband can facilitate provision of medical
23 care to unserved and underserved populations through remote diagnosis,
24 treatment, monitoring, and consultations with specialists.
25
26 • **Economic Development/E-Commerce** Broadband can promote economic
27 development and revitalization through electronic commerce
28 (e-commerce) by:
29 Creating new jobs and attracting new industries.
30 Providing access to regional, national, and worldwide markets.
31
32 • **Electronic Government (E-Government)** Electronic government can help
33 streamline people's interaction with government agencies, and provide
34 information about government policies, procedures, benefits, and programs.
35

1 • **Public Safety and Homeland Security** Broadband can help protect the
2 public by facilitating and promoting public safety information and
3 procedures, including, but not limited to:

- 4 Early warning/public alert systems and disaster preparation programs.
- 5 Remote security monitoring and real time security background checks.
- 6 Backup systems for public safety communications networks.

7
8 • **Innovative Applications** Broadband provides easier access to newer
9 telecommunications technologies such as Voice Over Internet Protocol
10 (VoIP), which allows voice communication using the Internet. VoIP may be a
11 useful and lower cost telecommunications alternative in rural areas. Some
12 VoIP services require a special VoIP phone, while other services allow
13 consumers to use a traditional phone with an adaptor. For general information
14 about VoIP, see www.fcc.gov/voip. For information about emergency 911
15 access while using VoIP, see www.voip911.gov. Broadband also permits
16 people with hearing or speech disabilities whose primary language is
17 American Sign Language to use Video Relay Service (VRS) to communicate
18 more easily, quickly, and expressively.”

19

20 Q. WHAT BROADBAND CUSTOMER SERVICES DOES VITELCO
21 OFFER?

22

23 A. Broadband capabilities throughout VITELCO’s network are severely limited.
24 Network architecture limitations impose a maximum download speed of
25 approximately 1.0 megabits per second for DSL service and 1.544 megabits
26 per second for digital data services. Higher transmission speeds are possible
27 only by the provision of multiple DS-1 facilities. While some fiber optic
28 facilities were noted in the “backbone” interconnecting equipment sites, fiber
29 optic facilities have not yet been deployed “deeper” into the network, as a
30 result of which the high transmission speeds routinely available on the
31 mainland are not available to VITELCO’s customers. While it would be
32 possible to increase transmission speeds by multiplexing (that is, digitally

1 combining into higher bandwidths) lower speed facilities, this is a more
2 costly, and less efficient arrangement.

3

4 VITELCO does not offer the higher speed data transport services common in
5 other carriers' networks, and Internet Protocol (IP) based services, including
6 Voice over Internet Protocol (VoIP), are virtually non-existent.

7

8 Q. WHAT SERVICE CAPABILITIES ARE COMMON IN MOST AREAS OF
9 THE MAINLAND?

10

11 A. While not all services offered are ubiquitously available, the services and
12 capabilities generally available to most business customers in the United
13 States fall into five (5) broad categories:

- 14 1. Local services
- 15 2. Access and transport services
- 16 3. Data services
- 17 4. Conference services
- 18 5. VoIP services

19

20

21 Q. PLEASE PROVIDE AN OVERVIEW OF LOCAL SERVICES AND
22 VITELCO'S CURRENT ABILITY TO PROVIDE THOSE SERVICES.

23

24 A. Local switched services (for other than residential and small business
25 customers) include:

*Direct Testimony of W. Keith Milner
On Behalf of Virgin Islands Telephone Company
Docket 578*

1 • **Centrex service** which provides central office-based networking for
2 voice and data needs.

3 • **Primary Rate ISDN (PRI) service** which is a switched data service
4 providing speeds at 1.544 Mbps.

5 VITELCO offers Centrex services but not PRI services to its customers.

6

7 Q. PLEASE PROVIDE AN OVERVIEW OF ACCESS AND TRANSPORT
8 SERVICES AND VITELCO'S CURRENT ABILITY TO PROVIDE THOSE
9 SERVICES.

10

11 A. **Ethernet access services** provide scalable bandwidth for switched or
12 dedicated "last mile" applications with bandwidth requirements ranging from
13 512k to 10G and above. Typical Ethernet services include Metropolitan Area
14 Network (MAN), Switched Ethernet and Wide-area Ethernet services.

15 ▪ **Metropolitan Area Network (MAN)** is a metro solution that provides
16 high capacity switched bandwidth to link a customer's locations
17 within a single metropolitan area.

18 ▪ **Dedicated, fiber-optic, point-to-point gigabit Ethernet services** link
19 a customer's local area networks (LANs) within a metropolitan or
20 regional area.

21

22 **Internet access services** provide high-speed dedicated access, global reach,
23 optimal performance and security. Access can be provided via a dedicated
24 circuit of pre-subscribed bandwidth between two or more customer locations.

1 The circuits are reserved for a single customer's exclusive use for voice, data,
2 video and multimedia, safeguarding sensitive or confidential information over
3 dedicated access services ranging from DS1 (1.544 Mbps) to OC-12 (622.08
4 Mbps). Internet Access services are used to meet a variety of business needs
5 such as connecting work-at-home employees and branch offices, providing
6 remote access to a Wide Area Network (WAN) environment, and to faster
7 transfer of large amounts of data over the Internet. Typical internet access
8 services include:

- 9 ▪ **Digital Subscriber Lines (DSL)** providing broadband access
10 delivered over an IP backbone.
- 11 ▪ **Business class DSL services** providing higher speed broadband access
12 delivered over an IP backbone.
- 13 ▪ **Managed Internet Services** providing a dedicated Internet connection
14 to multi-national sites.
- 15 ▪ **Wi-Fi "hotspots"** allow a customer's customers wireless internet
16 access at distances generally up to about 300 feet or less.
- 17 ▪ **Wired Ethernet connections** allow traveler's access to the Internet at
18 hotels.

19 **Optical Ring Services** provide reliable solutions that can be easily modified
20 to meet changing infrastructure requirements and unpredictable network
21 demands using a flexible metropolitan area network (MAN) ring solution with
22 bandwidth solutions ranging from 150Mbps to OC-192, or converged

1 Synchronous Optical Network SONET/DWDM rings. Typical services
2 include:

- 3 ▪ **Private SONET rings** providing dedicated high-speed access for
4 consolidating all of a customer's traffic including private line,
5 switched and enhanced services, and local and long distance carrier
6 traffic (voice, data and video).

- 7 ▪ **SONET backbone services** accommodating additional capacity as a
8 customer's business needs increase. SONET provides high-speed
9 services for consolidating voice, data, Ethernet and video traffic on
10 one optical fiber access service.

11 VITELCO provides no Ethernet services, only relatively low-speed DSL
12 Internet access service (limited to about 1.0 megabits per second downstream)
13 and no optical ring services. Sophisticated business customers on the
14 mainland routinely insist upon Ethernet and optical services because of the
15 dynamic features and cost efficiencies such services entail.

16

17 Q. PLEASE PROVIDE AN OVERVIEW OF DATA SERVICES AND
18 VITELCO'S CURRENT ABILITY TO PROVIDE THOSE SERVICES.

19

20 A. Data services include packet switching services, video services and private
21 line services.

22 **Packet switching services**

23 **Asynchronous Transfer Mode (ATM) service** transports customer data at
24 the highest speed available at the lowest delay permitted for each type of

1 information. For example, most voice and video traffic demands the lowest
2 delay. ATM Service ensures high reliability and throughput providing
3 sustained bursting capabilities beyond the Committed Information Rate (CIR)
4 for an extended period of time as well as proactive congestion management.
5 At the core of the ATM network is a Multi-Protocol Label Switching (MPLS)
6 backbone that provides high-speed reliability, low congestion, and consistent
7 performance. The backbone uses high-speed ATM cell relay nodes connected
8 by a network of DS3s, OC3s and OC12s trunks. Local ATM Service will
9 connect a customer's locations in the same LATA. Long distance and
10 international ATM Services are available to interconnect a customer's local
11 ATM locations for an "end-to-end" ATM solution.

12 **Frame Relay Service** is a global data network based on a simplified form of
13 packet switching in which synchronous frames of data are routed to specified
14 destinations within a defined network. Frame Relay Service is an end-to-end,
15 data network offering based on frame relay technology providing fast,
16 efficient and reliable many-to-many connectivity. Asynchronous Transfer
17 Mode (ATM) switching backbone is used to maintain reliability, low
18 congestion and consistent performance. Customers needing even greater data
19 transmission capabilities than those available with Frame Relay services can
20 use Asynchronous Transfer Mode (ATM) services instead.

21 **Video Services**

22 **Video Services** deliver broadcast-quality video and typically allow a range of
23 services from occasional video connectivity to the resources of a dedicated
24 video network. Video Service supports the needs of broadcasters, sports

1 teams, film studios and production houses. Video Services use all-digital,
2 high-speed fiber optic networks (typically with transmission speeds ranging
3 from 4 to 22Mbps).

4 **Private line service**

5 **Private Line Service** is a digital network service that provides the
6 transmission path for private digital data lines and supports simultaneous,
7 two-way transmission of voice, data, video, or any signal that can be encoded
8 digitally - in any combination - over dedicated facilities. Private line services
9 include:

- 10 • Local Private Lines providing a dedicated circuit between two
11 locations in the same metropolitan area at low or high speeds. Low
12 speed private services include voice grade and analog data speeds of
13 9.6 Kbps and 56 Kbps. High speed services include digital
14 transmission at speeds ranging from 9.6 kbps, 56 Kbps, T1,
15 Channelized DS1, E1, DS3, OC3c, OC12c, OC48c, OC192c, Ethernet
16 and STM-1/STM-4

17 VITELCO offers no packet switching services, no video services and, while it
18 does offer private line services, those offerings are limited to DS-1 (1.544
19 Mbps) and lower speed services.

20

21 Q. PLEASE PROVIDE AN OVERVIEW OF CONFERENCING SERVICES
22 AND VITELCO'S CURRENT ABILITY TO PROVIDE THOSE
23 SERVICES.

24

1 A. Conferencing Services provide audio, web, and video tools to help businesses
2 conduct meetings faster and more efficiently. A variety of conferencing
3 services are available ranging from simple conferencing services up to and
4 including integrated audio, Web, and video conferences.

5 **Video Conferencing Services** allow two or more sites to join the same pre-
6 scheduled video conference call at anytime and from anywhere.

7 **Internet Protocol Audio Conferencing Service** is a network-based,
8 reservationless conferencing solution providing enhanced features, optimized
9 call flows, strengthened reliability and availability, advanced web-based tools
10 and integration with web-based collaboration applications.

11 At present VITELCO does not offer conferencing services.

12

13 Q. PLEASE PROVIDE AN OVERVIEW OF VoIP SERVICES AND
14 VITELCO'S CURRENT ABILITY TO PROVIDE THOSE SERVICES.

15

16 **Network-based VoIP Solutions** provide customers with flexibility and
17 control over their voice applications, over broadband connections.

18 **Virtual Private Networks** provide dedicated broadband and remote access
19 solutions for your connection to the public networks and the Internet.
20 Intelligent devices such as firewalls or VPN tunnel terminators are established
21 by programming the appropriate levels of network security, user access
22 control and bandwidth prioritization. VPN solutions utilize IPsec (Internet
23 Security Protocol) or SSL (Secure Sockets Layer) to prevent data tampering

1 and help ensure the confidentiality, integrity and authenticity of data
2 communications.

3 **Remote Access Services** provide seamless, password protected, secure
4 integration of wireline and wireless access technologies and mobile solutions
5 as an extension of existing enterprise infrastructures.

6 At present VITELCO does not offer VoIP, VPN, or remote access services.

7

8 Q. PLEASE SUMMARIZE VITELCO'S CURRENT SERVICE OFFERINGS.

9

10 A. At present, VITELCO offers only the most basic telephone services to its
11 customers. While it provides Centrex and limited DSL and DS-1 based
12 services, it does not offer the kinds of redundant, high capacity services that
13 business customers demand such as optical ring services, Ethernet based
14 services, and Internet Protocol based services.

15

16 Q. YOUR INSPECTION CONCLUDED THAT VITELCO'S SWITCHING
17 EQUIPMENT IS IN REASONABLE CONDITION. IF SO, WHY WOULD
18 VITELCO REPLACE ITS SWITCHING EQUIPMENT?

19

20 A. For two reasons. First, VITELCO's switching equipment is not capable of
21 handling the types of services business customers need and deploying such
22 capabilities would likely be more expensive than simply replacing existing
23 switches with state-of-the-art switches. Second, the software running on
24 VITELCO's switches is woefully out of date. Most switching equipment

1 manufacturers generally require that software upgrades be performed
2 sequentially without skipping major software releases (called "generics"). In
3 other words, manufacturers often require that to move from Generic Release 1
4 to Generic Release 4 that the intervening Generic Releases 2 and 3 be loaded
5 before Generic Release 4. This is done to ensure stability of the switching
6 platform during these retrofits. Since right-to-use fees might be applied for
7 each intervening Generic Release, VITELCO may find it more economical to
8 simply replace its switches than to pay for eight or more software releases. Of
9 course, VITELCO is free to negotiate a special arrangement with the
10 manufacturer (Nortel) to bring the software up to standard but I do not know
11 whether such negotiations would be successful or even beneficial.

12
13 Q. WHAT IS THE OPTIMAL REPLACEMENT TECHNOLOGY SHOULD
14 VITELCO CHOOSE TO REPLACE ITS CURRENT INFRASTRUCTURE?

15
16 A. The answer to that question depends upon the service demand from
17 VITELCO's existing and future customer base. Two broad alternatives exist,
18 both with relative advantages and disadvantages. One approach would be to
19 deploy so-called "soft switches" to replace the current circuit switches and to
20 interconnect the switches with fiber optics as nearly ubiquitously as possible.
21 The fiber optic deployment would follow a "fiber to the premises," "fiber to
22 the curb" or "fiber to the node" strategy depending on the ultimate
23 transmission speeds the network must carry to and from end users. The
24 question of ultimate transmission speeds and volumes must consider whether
25 the network would ultimately replace some or all cable television transport

1 facilities and also whether the network would carry traffic from and between
2 wireless cell sites. A second alternative would be to pervasively deploy fiber
3 optic technology in the “backbone” but rely on wireless alternatives such as
4 “WiMax” wireless technology to provide the so-called “last mile”
5 connectivity to the customers’ premises.

6

7 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

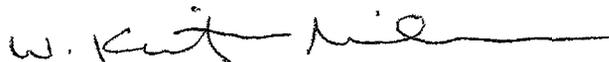
8

9 A. Yes.

DECLARATION

I, W. Keith Milner, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on 09/24/2008



W. Keith Milner