

**EXHIBIT CONFIDENTIAL
NOT FOR PUBLIC INSPECTION**

EXHIBIT 6

REDACTED -- FOR PUBLIC INSPECTION

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C.

In the Matter of)	
)	
Zoom Telephonics, Inc.)	File No. CSR-_____
Complainant)	
)	
v.)	
)	
Comcast Corporation)	
Defendant)	

DECLARATION OF CHARLES CUSSON

1. My name is Charles Cusson. My business address is 1002 Cornerstone Blvd., Downingtown, Pa. 19335.
2. I am the Director of Physical & Environmental Evaluations for Comcast Cable Communications, LLC ("Comcast Cable" and, together with its affiliates, "Comcast"). I have over 39 years experience within the communications and cable industries. I hold a General Radiotelephone Operators FCC License, #PG-1-18539. I previously held a First Class Radiotelephone Operator FCC License. Prior to joining Comcast, I was the President and CEO of CK Engineering LLC for over 7 years, and a Sr. Director Engineering at Time Warner Cable's Reading Pa. Division for over 4 years.
3. In my current position at Comcast, I manage requests for product evaluations, establish testing priorities, and review all product testing evaluations for product approval/recommendation. My team performs, oversees, or evaluates physical and environmental ("P&E") testing for all new or modified hardware deployed on the Comcast network. The products range from simple radiofrequency ("RF") connectors to

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more advanced devices such as Edge Quadrature Amplitude Modulators (“EQAMs”), Cable Modem Termination Systems (“CMTSes”), routers, switches, optical Dense Wave-Division Multiplexing (“DWDM”) and Coarse Wave-Division Multiplexing (“CWDM”) transmitters, power supplies, and all customer premise equipment (“CPE”), including all set-top boxes and all devices that incorporate Data Over Cable System Interface Specification (“DOCSIS”) technologies, including modems and embedded multimedia terminal adapters (“eMTAs”).

4. In developing this declaration, I consulted with colleagues and staff who have direct experience with the testing requirements that are at issue in this proceeding, as well as the reasons why we have implemented these requirements.

I. P&E Testing Ensures That Devices Work Safely and Reliably in Real-World Environments.

5. Today, Comcast requires P&E testing for all devices, including DOCSIS modems, that are to be deployed on Comcast’s High-Speed Internet (“HSI”) network. This testing is generally aimed at addressing our customers’ concerns about poor service and reliability issues with equipment. We test to ensure that the devices work safely and reliably on our networks in real-world environments.

6. Comcast has legitimate reasons to concern itself with the safety and performance of products that will be used by customers and our networks. Because Comcast has an ongoing relationship with its customers, they will turn to Comcast first to address safety and performance issues that may arise in the use of devices needed to access our HSI service. Therefore, Comcast believes thorough product evaluations are in the best interests of our customers and the protection of Comcast’s investments.

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7. P&E testing is not intended to restrict companies from producing and selling retail DOCSIS modems and other devices that can be used to access our HSI service. Comcast has a long track record in support of new product deployment into our networks and customer premises. This testing is designed to help our vendors produce and sell high-quality, high-performing products. We want our vendors to be successful because it increases our ability to attract consumers and increases the likelihood that our customers will receive and be satisfied with the services they purchase and we deliver.

II. P&E Testing Is a Necessary Complement to FCC Certification Requirements and the Testing Performed by CableLabs and Underwriters' Laboratories.

8. P&E testing is an important complement to the other testing programs that DOCSIS devices and other CPE go through before they can be commercially deployed on Comcast's network. For example, testing done to ensure that a DOCSIS device complies with FCC standards regarding signal emission and safety standards tested by Underwriters Laboratories ("UL") provide an important benchmark against which to measure the device's performance. However, while these tests are necessary, they are not sufficient to demonstrate that the device will function properly and reliably when deployed on Comcast's network. Likewise, CableLabs' testing is important to verify factors like conformance with the DOCSIS specification, but also is insufficient.

9. FCC compliance testing and testing programs performed by UL and CableLabs are done in a lab environment that is close to the optimum operating environment. These testing programs do *not* assess performance in the actual environment in which the devices will be used. Similarly, Comcast's DOCSIS testing may confirm that the device will function properly and interoperate when deployed on

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our network, but it does not test the safety and reliability of the device in light of the various physical and environmental issues that arise. Temperature, humidity, vibration, aging, external electrical variations, noise, and RF interference are ever-present in our customers' homes and offices, as well as Comcast's headends and network environments, and must be taken into account to ensure the devices deliver reliable service over time.

10. Comcast's P&E testing is designed to replicate the real-world environments that these devices may encounter in any one of the diverse geographic areas we serve. In our experience, many devices that work perfectly well in a lab environment encounter problems when subjected to the kinds of environments and usage patterns employed by our customers. It is quite common that our vendors will deliver to us a device that has passed certifications by other bodies or laboratories but that fails to perform in a real-world environment.

11. One example of how our testing accounts for real-world conditions relates to how DOCSIS devices interact with other devices in the home and office environment. Notably, FCC compliance testing ensures that the amount of energy exiting the DOCSIS device does not interfere with other devices, but it does not account for how energy present around the device will affect the DOCSIS device's intended performance and its ability to shield outside interference.

12. Comcast initially began noticing this kind of problem in set-top boxes that operated in the presence of certain mobile wireless services. When a particular provider's cell phones were used within relatively close proximity of a set-top box, the energy emitted by the cell phone caused the set-top box to completely lose its signal. We discovered similar issues with DOCSIS devices, including DOCSIS modems. For

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example, we learned that more common environmental factors, such as the use of a vacuum cleaner or a cordless phone near the DOCSIS device, interfered with the proper performance of our HSI service if the DOCSIS device was not properly shielded against the interference generated by the other devices in the home.

13. The introduction of many new wireless devices, as well as devices with increased processing power, in the home has compounded these interference risks for devices connected to our network that are not properly shielded. There are a number of potential sources of interference:

- In-house electrical wiring that is unshielded;
- Gaming systems using wireless communications between base stations, controllers, and user devices;
- Routers using wireless communications between personal computers, access points, video players, audio players, and similar wireless consumer devices; and
- Wireless peripherals communicating between the peripheral (e.g., keyboard) and the device to which the peripheral is linked.

14. Neither FCC compliance tests, tests by UL or CableLabs, nor Comcast's own DOCSIS testing will determine whether the DOCSIS device could adequately shield this kind of interference and work properly in light of the various impairments that the device will experience in the "real-world" environments where it is deployed. Some examples of interference-related and other issues in devices that have received certification from these entities but had problems upon deployment or during initial testing include:

- An eMTA that was deployed without full P&E testing experienced a large increase in trouble calls after installation. Post-deployment testing revealed that, among other problems, the unit suffered significant signal degradation in

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the presence of interference caused by impairments that exist on most standard DOCSIS networks. The device could not work in this environment due to poor quality design and flawed operating parameters.

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- Several units of a set-top box model that was deployed with limited P&E testing were found to have significant burn marks after being reported as failed by customers. Follow-up revealed that a marginal switched mode power supply ("SMPS") design would fail during "brownout" conditions (i.e., a condition in which voltage drops and current increases), causing heat and potentially fires. In this unusual case, a brownout could cause the failure of a field effect transistor ("FET"). The failure caused a long slow burn of the circuit board with flames that escaped the external housing. This experience led to the establishment of a new P&E test that applied a thermal test to devices that use SMPS without the circuitry necessary to prevent SMPS operation in brownout conditions. This test ensures no critical failure or danger to the customer or the network.

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- A DOCSIS 2.0 modem that did not go through P&E testing and was deployed on our network had a failure rate nationally of 27%. Data indicate that the failure rate increased from 3% to 26% in the Gulf of Mexico area due to surge failures during storm seasons. This data was supplied to us by Comcast Engineering Operations.

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15. After experiencing and evaluating products and network technical issues, Comcast determined that it was necessary to test devices connected to our network to

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deliver Comcast's services for various types of interference and other P&E-related issues. Comcast concluded that such testing was essential to developing and deploying high-quality broadband Internet services and digital voice services. Importantly, the interference and other P&E-related issues affecting devices used to obtain Comcast's services would significantly degrade and disrupt customers' services, especially with respect to services used to make a voice call, and particularly an emergency call. As a result, Comcast tests these devices to ensure that they can withstand various environmental and other P&E issues that we have observed on our network and with other household devices.

II. P&E Testing Ensures That DOCSIS Devices Will Perform Safely and Reliably on Comcast's Broadband Network.

16. Comcast's P&E testing includes a number of elements aimed at ensuring the performance, safety, and reliability of DOCSIS devices on Comcast's network. Many of the testing requirements are essential to ensuring the proper functioning of these devices. This includes ensuring that these devices do not cause electronic or physical harm -- to our customers or to the network -- when they are subjected to real-world circumstances and environments.

17. In Comcast's P&E testing, the DOCSIS devices are tested for:

- **Overheating** -- These tests ensure that the device does not overheat and cause equipment and service malfunctions, such as causing fires, in the various operating conditions experienced in Comcast's service areas and in customers' homes. Overheating can also have a negative effect on the device's "mean time between failure" ("MTBF"), reducing the device's expected life span.
- **Power Interruptions** -- These tests ensure that the device can withstand interruptions of power of varying durations, and measure how long the device will take to reboot after a power outage (note that the customer is without

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Internet service until the modem is rebooted, even if Comcast's service to the home has been restored). While UL testing evaluates a device's performance using a steady voltage or assuming that a device is turned off after usage, Comcast's P&E testing acknowledges that voltage into a device is not always consistent and that users typically do not turn off the device after each use.

- **Interference** -- These tests ensure that the device can operate reliably in an environment where it is in close proximity to other electronics equipment and subject to "everyday" external RF energy fields, such as those described above caused by mobile phones, other devices that communicate wirelessly (e.g., cordless phones and wireless game controllers), and even everyday household items such as vacuum cleaners.
- **SMPS Functionality** -- As discussed briefly above, certain SMPS devices do not have circuitry necessary to prevent operation in brownout conditions. Our tests on those devices ensure that the SMPS will not cause critical failure or danger.
- **Electrostatic Discharge/Electric Surges** -- These tests ensure that the device operates or recovers properly after experiencing various common occurrences, such as an electrostatic discharge caused by someone touching the modem and creating an electrical static surge.
- **Network Impairments/System Performance** -- These tests relate to the minimum requirements a device needs to have in order to operate correctly in light of the noise, distortions, and other impairments that typically are present in the network at a subscriber's home or outlet. As the signal travels from the primary distribution point, it is modified and amplified numerous times. This degrades the signal. Ensuring that a device can withstand these impairments helps guarantee that the device will perform well in most environments in which the product is deployed.
- **Bonded Channel Testing** -- These tests, based on the SCTE 40 environmental test plans, ensure that new DOCSIS 3.0 devices, which use bonded channel technology to increase the throughput available to the end user, can operate reliably and consistently in light of the various environmental factors that they are certain to encounter when deployed in customers' homes and offices. As mentioned above, without these tests, our customers could experience a loss of data throughput during even relatively commonplace environmental changes in our networks.

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III. P&E Testing Procedures Are Designed To Facilitate Testing for Comcast's Vendor Partners and Accommodate Particular Circumstances.

18. Comcast's testing policies are flexible. We try to accommodate our vendors and help facilitate testing that is not expensive or time-consuming while still achieving the goal of ensuring that every device attached to Comcast's network is a high-quality, safe product that provides the kind of reliability and performance that our customers should expect.

19. One of the ways in which we are flexible is that we allow vendors to perform testing either at their own facilities or at an independent laboratory, whichever they find is the most capable, convenient, and expedient. The vendor would cover the cost of using an independent laboratory. Comcast does not currently have the facilities and equipment necessary to conduct P&E testing, and it has proved much more economical for both the manufacturer and Comcast to perform the testing at the manufacturer's facilities or in an independent laboratory. In most cases, our vendors find it most convenient to simply use their existing facilities.

20. We require that at least one, and sometimes two, Comcast evaluation engineers be present for this testing. When the testing takes place in North America, Comcast covers any travel, hotel, and associated expenditures. When testing takes place outside North America, Comcast asks that the vendor pay for travel expenses.

21. We normally budget approximately 150 engineering hours for testing a particular device. We do not charge our vendors for this time, however. Also, a testing cycle typically takes approximately three to four weeks, with approximately 7 days of on-site testing. For well-built devices, this is usually the extent of the testing experience.

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However, in some cases, Comcast has worked with the vendor for months to address issues with a particular device.

22. With respect to travel, Comcast's general company policy is that Comcast employees traveling within North America travel coach class. Employees traveling outside of North America for any reason travel business class. This is Comcast's policy regardless of who is paying for the travel.

23. With respect to hotel accommodations, Zoom's claim that we require vendors to lodge our employees at "five-star" hotels is completely false. The only requirement we impose with respect to lodging is that lodging be as close to the testing facility as possible to minimize daily travel time between the hotel and testing facility. Comcast test engineers get their hotel recommendations from the vendor and typically stay at the same hotel as the vendor. To date, all overseas travel hotel reservations have been recommended and handled by the vendor, as we are not familiar with the country and lab locations.

24. Because many of our tests are simply verifying that a manufacturer has complied with test documentation and standards, one of the keys to ensuring a smooth testing process is manufacturer documentation. Documented test results provide a powerful tool demonstrating professionalism, capability, and organizational process. Knowing that a company has designed and built its product with skill and forethought and in compliance with the rules, guidelines, and government requirements is critical. Our experience is that companies weak on testing and documentation often have weak products, riddled with issues. Identifying these issues in advance is another customer benefit of doing P&E testing.

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25. We also ask our vendors to resubmit their devices for testing and certification whenever they make hardware changes to their devices. In the past, we have had situations where a vendor made changes to their device that caused problems that could have been tested and addressed had the vendor simply submitted the device to Comcast for re-testing. For example, a manufacturer of set-top boxes had submitted a device for Comcast's approval, including P&E testing. The manufacturer later decided to make a hardware change and did not notify Comcast of the change. When the device was deployed with the change, customers started complaining about interference from other electronic products within their home. When the device was retested, we discovered a shielding hardware change had lowered the product's ability to block outside interference and the product no longer met our shielding requirements. This requirement for retest is another benefit for assuring customer product reliability by Comcast, above and beyond the UL, CableLabs, and FCC compliance testing.

III. Zoom Mischaracterizes a Number of P&E Testing Requirements.

26. In its Complaint, Zoom asserts that the "vast majority" of P&E testing parameters are irrelevant or unreasonable. This is incorrect. The Complaint selects a few requirements and presents them out of context in an attempt to paint the entire testing regime as unreasonable. This is an inaccurate picture of P&E testing.

27. Zoom complains that "Comcast evaluates the performance of cable modems at temperatures far above those generally found in the United States and far above those at which many other electronic devices are designed to operate" and "places greater restrictions on surface temperatures than are found in UL safety standards." Complaint ¶¶ 79-80. We do require that the surface of the DOCSIS device maintains a

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level of consistency that is not perceived as too hot to the touch within a comfortable room ambient temperature. This is an important customer satisfaction issue. If the customers feel the device is too hot to the touch, they will, as we have experienced, refuse to allow the product into their home.

28. Moreover, it is true that Comcast requires that DOCSIS devices perform at higher ambient temperatures than what one might consider “room temperature.” In our experience, customers tend to locate their DOCSIS devices and other CPE in their entertainment centers, closets, attics, basement, and other locations with poor ventilation and, sometimes, collocated with other electronic equipment. These locations are likely to be much warmer or colder than an average room temperature. As a result, we believe it is sensible to test these devices at both higher and lower temperatures to match the environments they will be deployed into. In addition, we use the Telcordia GR-63-Core standard as a guide for temperature, humidity, and environment requirements.

29. Zoom further asserts that “[e]ven if a cable modem were to suffer decreased performance at extremely high temperatures, this would not cause harm to the network or facilitate theft of service.” *Id.* This also is incorrect. Our experience is that, under certain conditions, DOCSIS devices and other CPE that reach certain temperatures could cause a variation in RF output and inject additional noise into our return upstream path. Enough noise or excessive RF levels sent back through our network could clip the optical node return laser, which could shut down the node. This could cause *multiple* customer outages.

30. Next, Zoom takes issue with requirements related to the application of certain substances to the device’s exterior, the device’s weight, the strength of the

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packaging, the labeling of the device, the placement of the bar code on the device's packaging, and humidity shock testing. Complaint ¶¶ 81-85, 87. None of these requirements is applicable to Zoom. These are important requirements that Comcast applies to those DOCSIS devices and other CPE that we purchase in bulk and then lease or resell to our customers. For example, packaging restrictions, including size and weight, allow us to maintain compliance with federal regulations for employees and contractors, and ensure that these devices can fit in the vehicles and shelves we have designed for stocking and deployment. In addition, Comcast requires bar coding on equipment it purchases directly from vendors for inventory tracking purposes. Likewise, the testing requirement regarding the number of times that the reset button is pressed is not applicable to Zoom's modem because it is a retail device and its device has a recessed reset button.

31. Our P&E test plan clearly anticipates that not all requirements will be applicable in all situations, stating that: [[

]] P&E Testing Plan at 6-7. Typically, Comcast would work with the vendor to determine which requirements are applicable and which are not. Zoom never discussed with Comcast whether there were any requirements that were not applicable to its device.

32. Moreover, because Comcast only recently determined that all retail devices used to obtain Comcast's Internet services should be subjected to P&E testing, the test plans sent to Zoom were the test plans for DOCSIS devices that Comcast purchases in bulk and leases or resells to its customers. Zoom's modem would have been

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the first retail device to complete P&E testing, and we had yet to develop a comprehensive P&E test plan for retail DOCSIS devices, so we shared with Zoom the test plan for DOCSIS devices that Comcast purchases. We understand that the documents need to provide clearer guidelines as to how individual tests apply to retail DOCSIS devices. We are in the process of updating the documents to address that, and we anticipate that this will be completed in the near future.

33. Zoom argues that our requirements regarding AC line voltage are unnecessary because “UL safety testing already confirms that Zoom’s cable modems meet relevant overvoltage protection requirements.” Complaint ¶ 86. This is not correct. In Comcast’s experience, the UL testing requirements do not sufficiently replicate the environments in which DOCSIS devices are used or the manner in which our customers use them. One unfortunate example of how this is true is the brownout example discussed above. By including this requirement in our testing, we are hoping to more closely replicate the real-world circumstances and environment in which these devices will have to function.

34. New tests are developed as the need arises. The set-top box example referenced above is a case involving a UL-approved set-top box that would catastrophically fail under slightly unusual brownout conditions. What was disturbing in this case was that 50% of the time a failure occurred, heat ignition of the printed circuit board also could occur. It would extinguish relatively quickly inside the unit, but, regardless, this was not an acceptable situation. The follow up was initiation of the SMPS test by Comcast. SMPSes are highly efficient devices but can operate in many different modes. Operation in the wrong mode can cause catastrophic failure under

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certain conditions unless the designer builds in appropriate safeguards. This new test is only requested if those safeguards are NOT built into the circuitry.

[Remainder of the page intentionally left blank.]

I declare under penalty of perjury that the foregoing is true and correct. Executed
on this 20th day of December, 2010.

A handwritten signature in black ink, appearing to read 'Charles Cusson', written over a horizontal line.

Charles Cusson
Director of Physical & Environmental Evaluations
Comcast Cable Communications, LLC

EXHIBIT 7

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From: Frank Manning [frankm@zoom.net]
Sent: Thursday, June 24, 2010 10:59 AM
To: Livingood, Jason; Iveson, Earle; Zapar, Will; Zedan, Nathan
Cc: Hume Vance
Subject: Thanks from Frank Manning of Zoom

I want to add my thanks to all of you at Comcast. The test process was long and stressful, given the pressure from Zoom's retailers; but I was very impressed by the professionalism of everyone at Comcast. You do a superb job in making sure that Comcast customers will have a good experience. And your test results were very helpful in driving Zoom to a better product. Thank you!

Regards,
Frank Manning
Zoom's President and CEO

From: Hume Vance
Sent: Thursday, June 24, 2010 10:48 AM
To: Jason Livingood; Iveson, Earle; Zapar, Will; Zedan, Nathan
Cc: Frank Manning
Subject: Thank you for help getting Zoom 5341 through Comcast approval process

Dear Jason, Earle, Will and Nathan,

I want to thank each of you for the efforts you made to help Zoom through the approval process at Comcast for our 5341 CM.

There were some bumps along the way, but we want to underline our appreciation for the improvements in our product that are a direct result of Comcast testing. The [REDACTED] was a serious problem. Additionally, thanks to your alert, we have significantly improved the [REDACTED] performance of our cable modem by [REDACTED] inside the unit. We moved fast after hearing your recommendation, and we already have UL certification for that modification.

We are proud to offer a strong product that will enable customers to enjoy the full benefits of their Comcast Internet services. We look forward to a continuing good relationship with Comcast.

Regards,

Hume

Hume Vance
Director, Firmware Engineering
Zoom Telephonics, Inc.
207 South Street
Boston, MA 02111
USA
humev@zoom.com
+1 617 753-0032

EXHIBIT 8

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From: Hume Vance [humev@zoom.net]
Sent: Wednesday, May 26, 2010 8:33 AM
To: Livingood, Jason
Cc: Griffiths, Chris; Carfagno, Joseph; Zedan, Nathan; Frank Manning
Subject: RE: Zoom Testing Update

Hi Jason,

I want to thank you again for the heads-up on this issue and for the call yesterday. Echoing what Frank said at the end of the meeting, we greatly appreciate that you have alerted us to this issue, and we appreciate the way that you have handled it.

Regards,

Hume

From: Jason Livingood [mailto:jason_livingood@cable.comcast.com]
Sent: Monday, May 24, 2010 4:50 PM
To: Hume Vance
Cc: Chris Griffiths; Carfagno, Joseph
Subject: Re: Zoom Testing Update

On 5/24/10 3:59 PM, "Hume Vance" <humev@zoom.net> wrote:

Hi Jason,

I don't mean to badger you, but it would help us a lot to know if the concern is [REDACTED]

Thanks,

Hume

From: Hume Vance
Sent: Monday, May 24, 2010 1:37 PM
To: 'Jason Livingood'
Cc: Chris Griffiths; Carfagno, Joseph
Subject: RE: Zoom Testing Update

Hi Jason,

I'd be happy to discuss this. Would it be possible to share more details before a call? For example, is the concern that [REDACTED], or is the concern more related to [REDACTED], or is it something else?

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My time doesn't tend to be heavily scheduled in advance, although there is a chance I may have to travel later in the week. In view of that, tomorrow a.m. works best for me (I am completely open for the entire morning).

Regards,

Hume

From: Jason Livingood [mailto:jason_livingood@cable.comcast.com]
Sent: Monday, May 24, 2010 1:02 PM
To: Hume Vance
Cc: Chris Griffiths; Carfagno, Joseph
Subject: Zoom Testing Update

Hume --

I am getting some concerning feedback from our lab concerning [REDACTED] of your device when operating at higher speeds (doing more work). Do you have any time later this week to hop on a call and discuss the issue?

Regards,
Jason

Jason Livingood
Executive Director
Internet Systems Engineering
National Engineering & Technical Operations
Comcast Cable Communications
215-286-7813
jason_livingood@cable.comcast.com

Regards,
Jason

Jason Livingood
Executive Director
Internet Systems Engineering
National Engineering & Technical Operations
Comcast Cable Communications
215-286-7813
jason_livingood@cable.comcast.com

EXHIBIT 9

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-----Original Message-----

From: Wallace, Bill [mailto:Bill.Wallace@arrisi.com]

Sent: Monday, December 20, 2010 4:05 PM

To: Cusson, Charles

Cc: O'Leary, Adrian; McClelland, Bruce

Subject: RE: P&E Value

ARRIS has been working with Comcast on new CPE product development and certification for almost 10 years. Comcast provides a broad set of product requirements in order to ensure interoperability, service integrity, and product longevity. The Physical and Environmental (P&E) product requirements and test process are a key part of these requirements, and ARRIS believes have contributed to improved products over time. Metrics such as Mean-Time-Between-Failure are key indicators of the product quality and have a direct affect on the consumers perception of overall service quality.

We have highlighted below several of the more rigorous P&E requirements which we believe have contributed to improved product performance. Compliance to these requirements is challenging and has taken several years of ARRIS investment to streamline both the development and test methodology to ensure smooth execution and minimize Time-to-Market.

Thermal Design: Product thermal design has a direct impact on product lifetime. A general engineering rule of thumb in the silicon industry is "a 10°C rise in average operating temperature results in a 50% reduction in MTBF," therefore, the better ventilated, efficient and heat tolerant (through component selection) the product is, the longer the expected lifetime. The Comcast requirement for full operation at 50°C ambient temperature forces the product designer to fully consider the thermal design to avoid restricted airflow and select appropriately rated components. This has a significant impact on the product's total life span, particularly with the variety of install locations in the home. ARRIS uses the 50°C specification for many of our CPE products outside Comcast.

The thermal requirements also have implications on the design of products that include embedded Battery Packs for operations during commercial AC failure. Providing good isolation between the circuit board and the battery pack is required to not only meet the specification, but extends the longevity of the battery packs.

Radiated Immunity: The Comcast Radiated Immunity specification is very challenging and has been difficult to meet, but adds significant benefit as many new devices are added to the home (Bluetooth, smart phones, wireless remotes, Wi-Fi, etc.), many with intentional radiators for communication. Immunity to these many interference sources directly contributes to improved user experience – interference manifests itself as dropped phone calls, slow data rates, and poor picture quality.

Surge Suppression: A common form of in-home product failure occurs when one of the interfaces (AC, RF, Ethernet, phone) experiences an excess input voltage/current (i.e. Lightning surge). Surge suppression has been an important specification in ARRIS products for many years as early generations of products were deployed in a harsher outdoor environment. Our current