CURRENT Group, LLC
Report of Measurements
CURRENT Gateway-Bridge OH 6030

Table of Contents

1. General Information

Applicant: CURRENT Group, LLC

Applicant Address: 20420 Century Boulevard
Germantown, MD 20874
301-944-2700

Equipment: CURRENT Gateway-Bridge OH 6030

Equipment Description: The CURRENT Gateway-Bridge OH 6030 is part of an Access BPL system. It operates on medium voltage overhead and underground public utility power lines and low voltage overhead public utility power lines.

The CURRENT Gateway-Bridge OH 6030 is the device that routes and controls data traffic between the overhead and underground medium-voltage lines as well as data traffic between the overhead medium voltage lines and overhead low voltage lines. The CURRENT Gateway-Bridge serves as a gateway to all customers powered from the same distribution transformer as itself. It communicates over the medium-voltage lines via the riser-pole CT Coupler® URD 5010rp and over the low-voltage system by a standard 240V two-wire connection.

Test Operator: David Zillich

Dates of Testing: February 12, 2008 to March 9, 2009

Test Locations:

- CURRENT Group Orchard Hills Test Area – Riser Pole (North Potomac, Maryland)
- Current Group Test and Research Site (Urbana, Maryland)
- CURRENT Group Rockville Test Area - (Macon Road and Old Drovers Lane in Rockville, Maryland)
- CURRENT Group Potomac Test Area – (Kentsdale Road and Tuckerman Lane in Potomac, MD)
- Washington Laboratories Open Area Test Site (Gaithersburg, Maryland)

Modes of Operation:

- LV: transmitting a high-density OFDM signal on the low voltage power line in the frequency range 4.4 MHz to 20.8 MHz by galvanically connecting directly to it.
- MV: transmitting a high-density OFDM signal on the underground medium voltage cable using the riser-pole CT Coupler URD 5010rp in the frequency range 4.4 MHz to 20.8 MHz and also in the 31.4 to 47.9 MHz high band.

Applicable EMC Specification: FCC Part 15, Subpart G

Class of Service:

- Class A

2. Applicable Documents

Testing of emissions was performed in accordance with FCC requirements.

2.1 Federal Communication Commission (FCC), code of Federal Regulations 47, FCC docket 89-103, Part 15: Radio Frequency Devices, Subpart G, October 2005.

2.2 Federal Communication Commission (FCC), code of Federal Regulations 47, FCC docket 89-103, Part 15: Radio Frequency Devices, Section 15.109(b) and 15.209, October 2001.

2.3 FCC/OET, "FCC Procedure for Measuring Electromagnetic Emissions for Digital Devices", TP-5, March 1989.

2.4 Federal Communication Commission (FCC), Report and Order, FCC-04-245, Appendix C, Measurement Guidelines for Broadband Over Power Line (BPL) Devices or Carrier Current Systems (CCS) and Certification Requirements for Access BPL Devices, October 2004.

2.5 International Special committee on Radio Interference (CISPR) Publication 16, First Edition 1977, "CISPR Specification for Radio Interference Measuring, Apparatus and Measurement Methods".

2.6 American National Standard, "Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz", ANSI C63.4, 2000.

3. Detailed Applicable EMC Requirements and Limits

The equipment was evaluated to Federal Communications Commission (FCC) requirements.

3.1 Conducted Limits

Conducted emissions limits do not apply to this Access BPL equipment.

3.2 Radiated Limits

The following radiated emissions limits apply:

Applicable Specification Reference	Frequency Range (MHz)	Class	Limit of Radiated Emissions		Measurement Distance (m)
			(µV/m)	(dBµV/m)	
FCC 15.107(c)(3), 15.109(c), 15.209	1.705 to 30	-	30	29.5	30
FCC 15.109	30 to 88	A	90	39.1	10
	88 to 216	A	150	43.5	10
	216 to 960	A	210	46.4	10
	960 and Above	A	300	49.5	10

Notes:

1. *The tighter limit shall apply at the edge between two frequency bands.*
2. *Distance refers to the distance in meters from measuring instrument antenna to the closest point of any part of the equipment under test.*

4. Procedures for Measuring RF Emissions

The following test procedures were used to measure RF emissions from the CURRENT Gateway-Bridge OH 6030.

4.1 AC Power Line Conducted Emissions Measurements

Conducted emissions limits do not apply to this Access BPL equipment.

4.2 Radiated Emissions Measurements

Measurements of radiated emissions were made using an EMC (spectrum) analyzer and calibrated broadband antennas. Tests were performed in the following frequency ranges: 1.705 MHz to 30 MHZ, 30 MHz to 50 MHz and 50 MHz to 1000 MHz. The CURRENT Gateway-Bridge OH 6030 was set and operated in a manner representative of actual use.

The CURRENT Gateway-Bridge OH 6030 is a derivative product of the CURRENT Gateway-Bridge URD 6121 and CURRENT Gateway-Bridge OH 6021. The CURRENT Gateway-Bridge OH 6030 differs from the CURRENT Gateway-Bridge URD 6121 only in the MV low band (4.4 to 20.8 MHz) transmit power. The CURRENT Gateway-Bridge OH 6030 MV high band (31.4 to 47.9 MHz) and LV low band (4.4 to 20.8 MHz), is identical to the CURRENT Bridge OH 6021. Therefore, the data from the compliance testing of the CURRENT Bridge OH 6021 in the LV low band (4.4 to 20.8 MHz), MV high band (31.4 to 47.9 MHz) and in the 50 to 1000 MHz range is directly applicable and is reproduced in this report for the CURRENT Gateway-Bridge OH 6030.

4.2.1 MV Radiated Emissions Measurement – 1.705 MHz to 30 MHz

In the frequency band 1.705 MHz to 30 MHz, the CURRENT Gateway-Bridge 6030 functions as an Access BPL device as described in FCC Rules, Sections 15.3(ff). Radiated emissions were measured at three representative field installation sites as required under the rules. The measurement procedures as described in Appendix C of the FCC BPL *Report and Order* (dated October 14, 2004) were rigorously followed.

The CURRENT Bridge was installed on a utility pole, approximately 7-9 meters above the ground. The CURRENT Bridge low voltage wires were connected to the power utility's low voltage power lines. The CURRENT Bridge medium voltage connector was connected to the riser-pole CT Coupler URD 5010rp which was installed on the power utility's medium voltage power line.

The CURRENT Bridge was operated remotely using Access BPL services. The Access BPL control equipment is described in Section 5. Control equipment was connected to the CURRENT Bridge through public utility wiring. For measurements of radiated emissions in the 4.4 MHz to 20.8 MHz transmission band, the CURRENT Bridge was configured to continuously transmit simulated high-density data traffic over the medium voltage power lines at its maximum output power level.

The test antenna was placed on the ground at a distance of 3 meters or 5 meters, depending on obstructions, and measured horizontally from the CURRENT Bridge . The antenna was kept at a fixed height of 1 meter. The antenna was moved to various locations around the CURRENT Bridge with radial spacing's of approximately 22.5°. The radiated emissions were measured at frequencies from 4.4 MHz to 20.8 MHz. All significant emissions were recorded.

At each test location during this initial sweep, the test antenna was rotated to find the orientation that resulted in maximum emissions. This antenna orientation was used for the remainder of emissions measurements at that antenna location. Small frequency ranges (typically 5 MHz) were spanned in order to increase resolution and to make it easier to identify emissions emanating from

the CURRENT Bridge. The spectrum analyzer was set to peak detection mode with the resolution bandwidth set to 9 kHz.

Quasi-peak measurements were made at each significant emission recorded during the initial sweep. For the quasi-peak measurements, the spectrum analyzer was set to quasi-peak detection and tuned to the recorded emission frequency using a narrow frequency span.

The horizontal distance from the antenna to the transformer case was used as the measurement distance. Measurements were compared to the limits given in Section 3.2, after correcting them for distance using an extrapolation factor of 40 dB/decade.

All significant emissions are reported in Appendix A of this report.

4.2.2 LV Radiated Emissions Measurement – 1.705 MHz to 30 MHz

In the frequency band 1.705 MHz to 30 MHz, the CURRENT Bridge functions as an Access BPL device as described in FCC Rules, Sections 15.3(ff). Radiated emissions were measured at three representative field installation sites as required under the rules. The measurement procedures as described in Appendix C of the FCC BPL *Report and Order* (dated October 14, 2004) were rigorously followed.

The CURRENT Bridge was installed in a residential neighborhood on a utility pole, approximately 7-9 meters above the ground. The CURRENT Bridge low-voltage wires were connected to the electric utility's low-voltage power lines. The CURRENT Bridge high band RF output was also routed to the electric utility's medium voltage lines via a CT Coupler.

The CURRENT Bridge was operated under local control for this testing using a secure diagnostic interface provided on the low voltage side. A battery-powered portable test set communicated with the CURRENT Bridge on the pole via the utility ground wire and was removed once the appropriate test transmissions were started. At the conclusion of testing the portable unit was once again used to shut down transmissions from the CURRENT Bridge mounted on the pole.

The test (loop) antenna was placed at a fixed height of 1 meter above ground level at a lateral distance of approximately 10 meters measured horizontally from the CURRENT Bridge and its associated overhead power lines. If the antenna could not be placed at this distance due to interference from conductive objects within the test area (e.g. parked cars) it was moved further away from the power line. The antenna was moved to the left and right of the CURRENT Bridge location parallel to the low-voltage power line a distance of 36 meters in 6 meter increments. These distances correspond to 1.5 wavelengths and ¼ wavelength of the center frequency of the LV signal respectively.

The LV-signal radiated emissions were measured at frequencies between 4.4 MHz to 20.8 MHz using an efficient, two step procedure. At each measurement location, the test antenna was initially rotated to identify the orientation showing maximum emissions and that orientation was used for all subsequent measurements.

The first step of the procedure identifies all significant emissions by capturing the spectrum at all test locations in peak detection mode with a resolution bandwidth of 9 KHz. Prior to further processing, these spectra are individually examined for inadvertent captures of impulse noise and/or other in-band coherent signals unrelated to the BPL equipment under test. Verified valid data is then further processed to extract the emissions at each OFDM carrier center frequency and sorted in descending order to yield a table of (frequency, spatial location) pairs to be subsequently examined.

In the second step of the procedure, quasi-peak measurements are then made manually with the EMC analyzer in peak hold/zero span mode and resolution bandwidth of 9 KHz at the 10 highest emission points identified via the above procedure.

The height of the low-voltage (LV) power lines was measured. Since the CURRENT Bridge must always be mounted above the LV power lines on the pole, only the slant range distance to the lines need be considered. The slant-range distance from the antenna to the nearest power line was calculated for each test location and the appropriate 40 dB/decade distance correction factor applied to the quasi-peak data for the 10 highest emission points. These final results were then compared to the limits given in Section 3.2 to yield the compliance margins shown in Appendix A.

4.2.3 MV Radiated Emissions Measurement – 30 MHz to 50 MHz

In the frequency band 30 MHz to 50 MHz, the CURRENT functions as an Access BPL device as described in FCC Rules, Sections 15.3(ff). Radiated emissions were measured at three representative field installation sites as required under the rules.

The CURRENT Bridge was installed, connected and operated in the same manner for this sequence of tests as discussed in Section 4.2.1 above. As above, the measurement procedures described in Appendix C of the FCC BPL *Report and Order* (dated October 14, 2004) were rigorously followed for this series with the addition of the 2-dimensional spatial probing for maximum emissions specified in Section 1, subparagraph 5.

The biconical test antenna was scanned over the 2-dimensional plane 7.6 meters to the left and right of the utility pole in 1.9 meter increments with antenna heights also varying from 1 to 4 meters. It was determined from an initial scan that the antenna orientation for maximum emissions was always horizontal and that orientation was used throughout this test.

The MV-signal radiated emissions were measured at frequencies between 31.4 MHz and 47.9 MHz using a similar two step procedure as discussed in Section 4.2.1 above.

The first step of the procedure identifies all significant emissions by capturing the spectrum at all test locations in peak detection mode with a resolution bandwidth of 120 KHz. Prior to further processing, these spectra are individually examined for inadvertent captures of impulse noise and/or other in-band coherent signals unrelated to the BPL equipment under test. Verified valid data is then further processed to extract the emissions at each OFDM carrier center frequency and sorted in descending order to yield a table of (frequency, spatial location) pairs to be subsequently examined.

In the second step of the procedure, quasi-peak measurements are then made manually with the EMC analyzer in peak hold/zero span mode and resolution bandwidth of 120 KHz at the 10 highest emission points identified via the above procedure.

The height of the CURRENT Bridge and associated medium voltage power lines were measured. Per the guidance provided by Andy Leimer in his presentation *Broadband over Power Line (BPL) Equipment Authorization – Detailed* (dated February 2006), the lesser of the slant range distance from the antenna to the nearest MV power line or the CURRENT Bridge itself was determined for each test location and the appropriate 20 dB/decade distance correction factor applied to the quasi-peak data for the 10 highest emission points. These final results were then compared to the limits given in Section 3.2 to yield the compliance margins also shown in Appendix A.

4.2.4 Radiated Emissions Measurement – 50 MHz to 1000 MHz

The CURRENT Bridge was mounted on a wooden table or stand in the same position in which it would be mounted in an actual installation. The stand positions the device under test (DUT) at a height above the ground plane of 0.8 meter. The power leads from the device were connected to the laboratory power source through a LISN. The device's medium voltage connections were terminated with standard 4' coaxial cables and 75-ohm resistors.

The CURRENT Bridge was operated remotely using a controlling computer and a commercially available power line modem. The control equipment is described in Section 5. Control equipment was connected to the DUT through the LISN. For measurements of radiated emissions above 50 MHz, the CURRENT Bridge was configured to continuously transmit simulated high-density data traffic over both the low-voltage and medium-voltage connections at the maximum output power levels.

The DUT was placed on a turntable at the Open Area Test Site. The test antenna was placed at a distance of 3 meters from the DUT and the radiated emissions were measured. The DUT was rotated in a complete circle while the spectrum analyzer performed a maximum-hold of measured emissions. All significant emissions were recorded.

During this initial sweep, the test antenna was installed on the antenna mast in the horizontal polarity at a height of 1 meter. Small frequency ranges (typically 100 MHz) were spanned in order to increase resolution and aid in the identification of emissions emanating from the DUT. The spectrum analyzer was set to peak detection mode with the resolution bandwidth set to 120 kHz.

Quasi-peak measurements were made at each emission recorded in the initial sweep. For the quasi-peak measurements, the spectrum analyzer was set to quasi-peak detection and tuned to the recorded emission frequency using a large frequency span. The frequency span was then reduced while keeping the spectrum analyzer's center frequency tuned to the emission's peak. The DUT was then rotated in a full circle to determine the direction of maximum emission. Further maximization of the emission was done by changing the height of the antenna from 1 meter to 4 meters.

The initial sweep to identify frequencies with significant emissions and the subsequent quasi-peak measurement process was repeated with the antenna in the vertical polarity.

All significant emissions are reported in Appendix A of this report.

5. System Test Configuration

Figure 1 shows the system configuration that was used for testing. Using Access BPL services, a manufacturing command was sent from the controller to the CURRENT Gateway-Bridge OH 6030, configuring it to continuously transmit simulated high-density data traffic over the low-voltage and medium-voltage connections at maximum output power levels.

In the laboratory, where a medium-voltage power line was not available, the controller was connected to the test configuration through a LISN and through the low-voltage power connection. An appropriate amount of attenuation was used to ensure that the HomePlug BPL modem's signal did not affect the desired measurement. During field testing, attenuation of signals from control devices was naturally provided by distance.

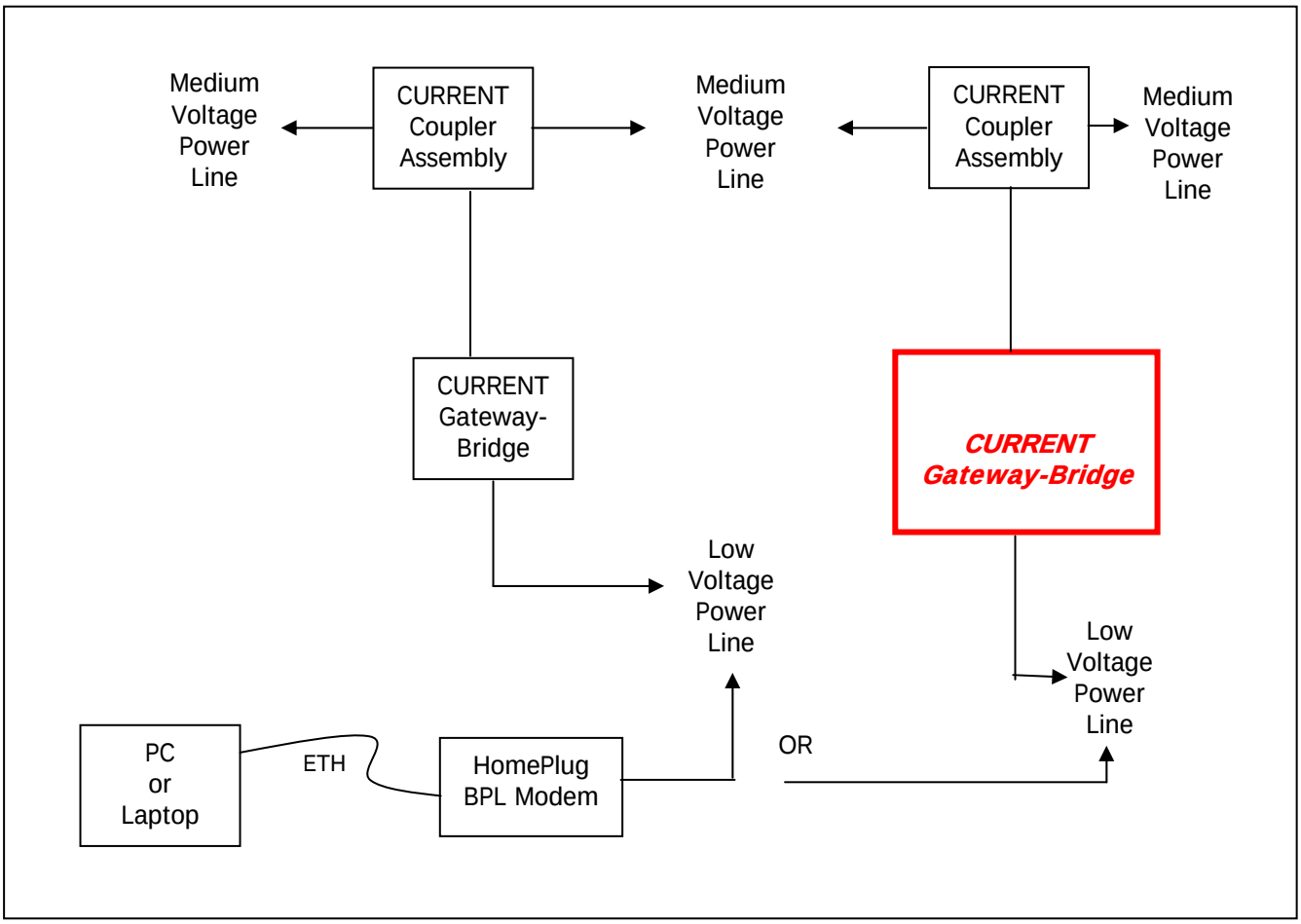

Figure 1: System Test Configuration

6. Equipment Modifications

The equipment tested was the latest version as of the date it was tested. There were no modifications necessary for compliance. In order to isolate MV 4.4 MHz to 20.8 MHz emissions, the LV 4.4 MHz to 20.8 MHz transmit signal was reduced by 30 dB.

7. Description of the Test Sites

Radiated emissions tests were conducted at three different field locations and one third party lab location. A description of each location is given below. A list of the testing performed at each location is included in the descriptive information for that location

CURRENT North Potomac Test Area

Location:	CURRENT Group Orchard Grove Test Area – Riser Pole Quince Orchard Drive/McDonald Chapel Drive North (North Potomac, Maryland)
Site Description:	System installation on a utility pole in a residential neighborhood. The riser pole feeds a URD (underground residential distribution) run. The overhead transformer is mounted on the same pole and is equipped with low-voltage wires and medium-voltage wires.

Height of Bridge:	7.62m
Distance to Pole:	3m or 5m, depending on obstructions
MV-wire Height:	11.8m

Site Diagrams:	See Figure 2, below.
Site Photos:	See Photograph B-1 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on March 5, 2009

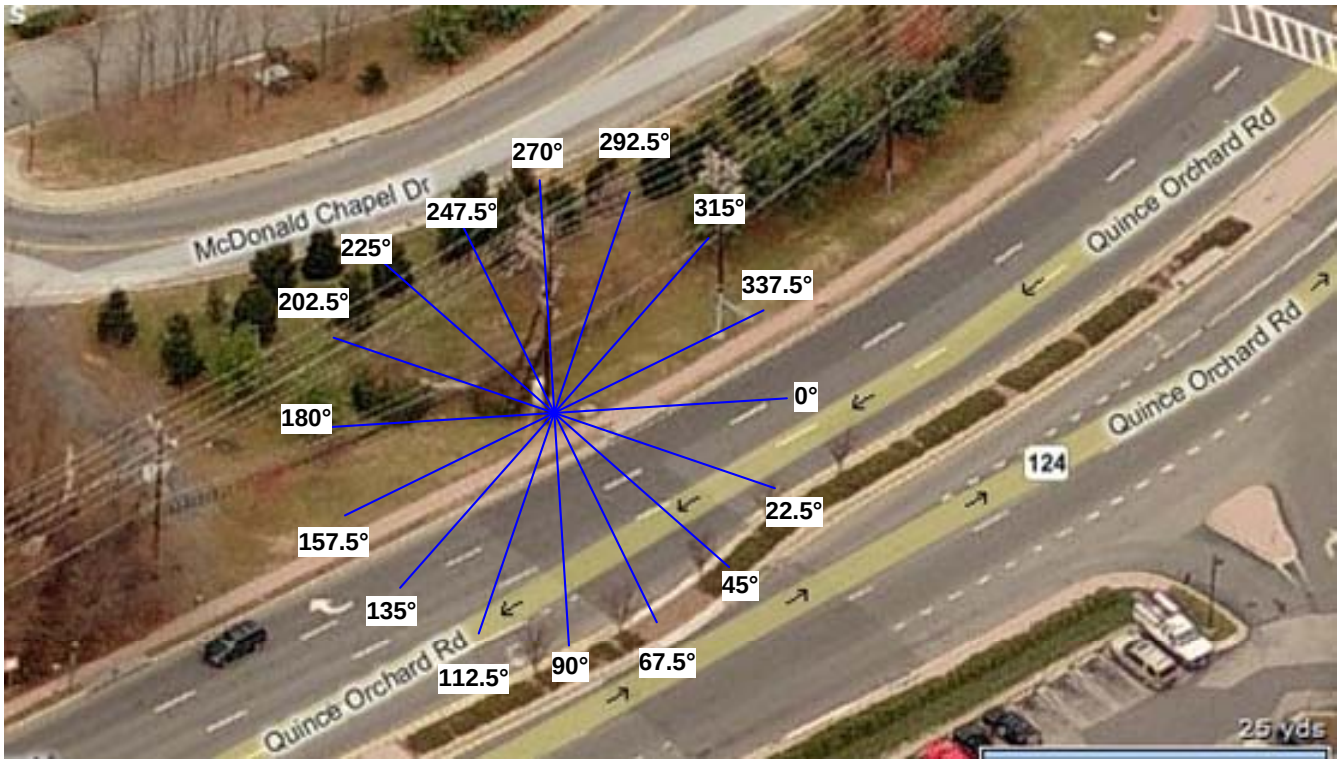

Figure 2: Test Site Diagram – CURRENT Orchard Grove Test Area

Current Group Test and Research Site – Pole 1

Location:	CURRENT Group Test and Research Site, 3280 Urbana Pike (Urbana, Maryland)
Site Description:	System installation on a utility pole in a field. The pole is equipped with overhead low-voltage and medium-voltage wiring, and a medium-voltage cable that feeds power from the overhead medium-voltage wires to an underground transformer. Height of Bridge: 6.9m Distance to Pole: 3m or 5m (replicating Orchard Grove distances) MV-wire Height: 11.1m
Site Diagrams:	See Figure 3, below.
Site Photos:	See Photographs B-2 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on March 9, 2009

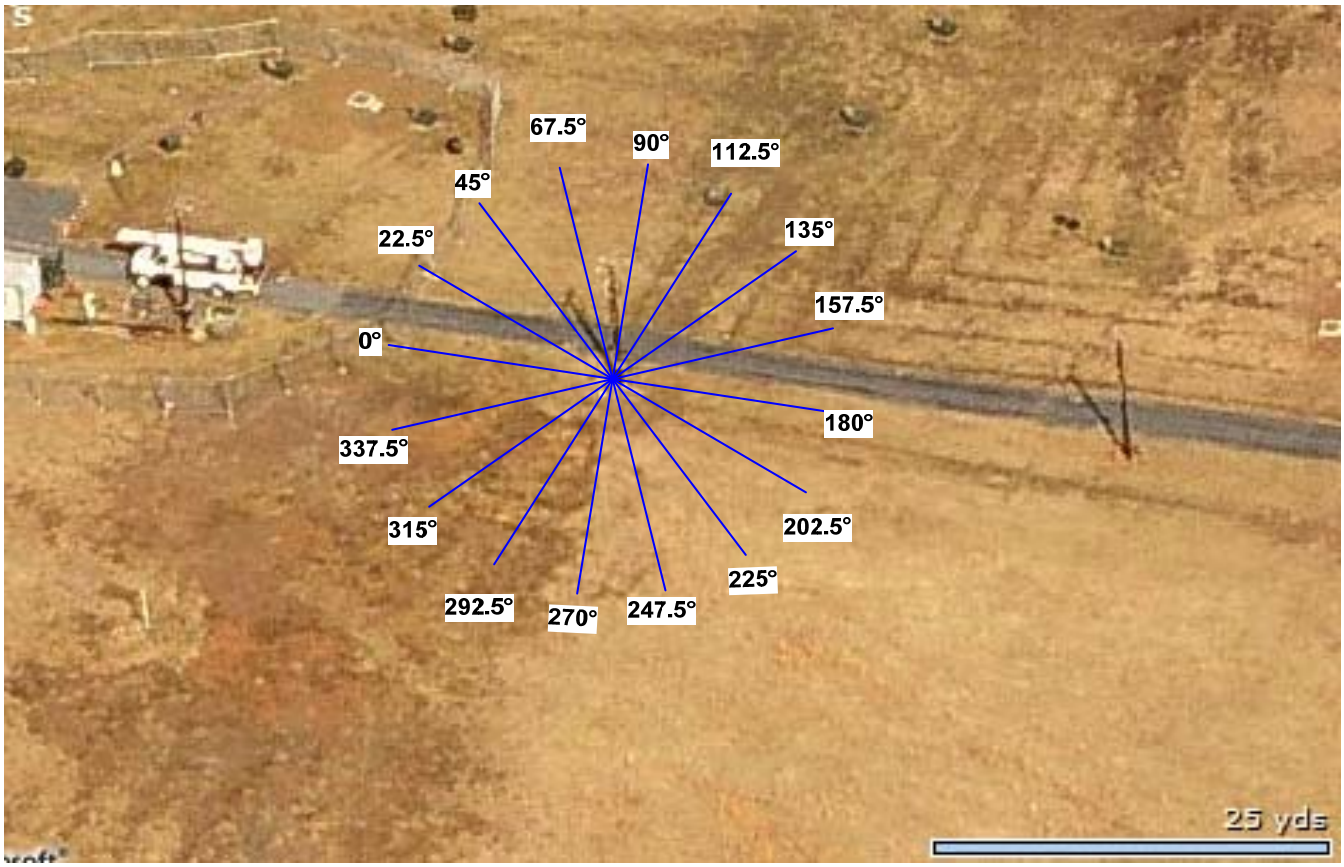

Figure 3: Test Site Diagram – CURRENT Group Test and Research Site, Pole 1

Current Group Test and Research Site – Pole 3

Location:	CURRENT Group Test and Research Site, 3280 Urbana Pike (Urbana, Maryland)
Site Description:	System installation on a utility pole in a field. The pole is equipped with overhead low-voltage and medium-voltage wiring, and a medium-voltage cable that feeds power from the overhead medium-voltage wires to an underground transformer. Height of Bridge: 6.9m Distance to Pole: 3m or 5m (replicating Orchard Grove distances) MV-wire Height: 10.9m
Site Diagrams:	See Figure 4, below.
Site Photos:	See Photographs B-3 and B-4 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on March 9, 2009

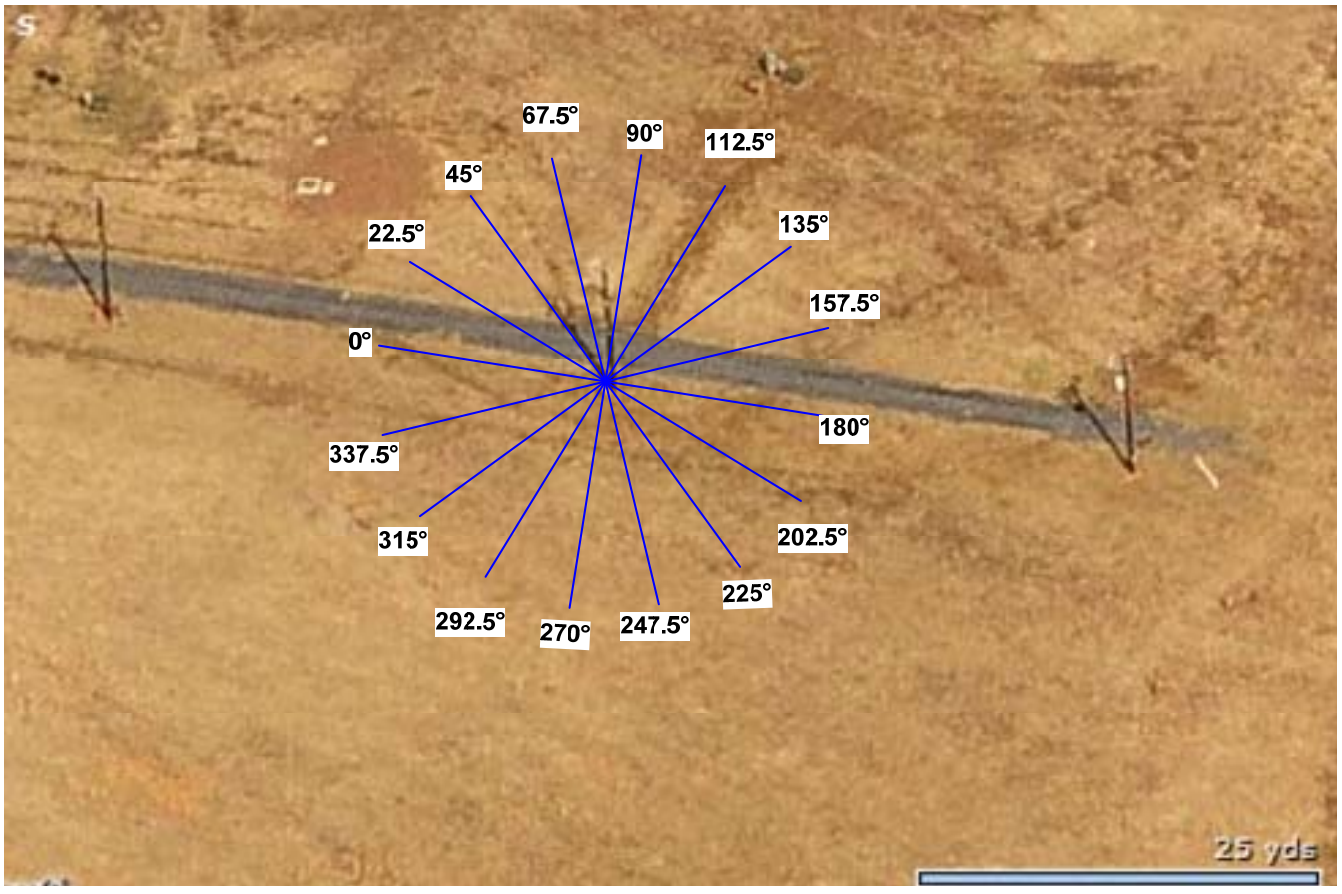

Figure 4: Test Site Diagram – CURRENT Group Test and Research Site, Pole 3

CURRENT Technologies Rockville Test Area – PLB1

Location:	4700 Macon Road Rockville, MD
Site Description:	System installation on a utility pole in a residential neighborhood. The pole is located next to a residential street and is equipped with a transformer, low-voltage wires and medium-voltage wires. Height of Bridge: 7.62m Distance to Pole: 9.00m LV-wire Height: 6.65m
Site Diagrams:	See Figure 5, below.
Site Photos:	See Photograph B-5 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on April 18, 2008

Figure 5: Test Site Diagram – CURRENT Group Rockville Test Area – PLB1

CURRENT Technologies Rockville Test Area – PLB2

Location:	4806 Macon Dr., Rockville, MD
Site Description:	System installation on a utility pole in a residential neighborhood. The pole is located next to a residential street and is equipped with a transformer, low-voltage wires and medium-voltage wires. Height of Bridge: 7.62m Distance to Pole: 9.75m LV-wire Height: 7.01m
Site Diagrams:	See Figure 6, below
Site Photos:	See Photographs B-6 and B-7 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on May 5, 2008

Figure 6: Test Site Diagram – CURRENT Group Rockville Test Area – PLB2

CURRENT Technologies Rockville Test Area – PLB4

Location:	11818 Old Drover Way, Rockville, MD
Site Description:	System installation on a utility pole in a residential neighborhood. The pole is located next to a residential street and is equipped with a transformer, low-voltage wires and medium-voltage wires. Height of Bridge: 7.77m Distance to Pole: 9.00m LV-wire Height: 7.22m
Site Diagrams:	See Figure 7, below
Site Photos:	See Photographs B-8 and B-9 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 1.705 MHz to 30 MHz, on March 6, 2008

Figure 7: Test Site Diagram – CURRENT Group Rockville Test Area – PLB4

CURRENT Technologies Potomac Test Area – 9417 Kentsdale

Location:	9417 Kentsdale, Rockville, MD
Site Description:	System installation on a utility pole in a residential neighborhood. The pole is located next to a residential street and is equipped with a transformer, low-voltage wires and medium-voltage wires. Height of Bridge: 9.11m Distance to Pole: 12.80m MV-wire Height: 11.58m
Site Diagram:	See Figure 8, below
Site Photos:	See Photographs B-10 and B-11 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 30 MHz to 50 MHz, on May 2, 2008

Figure 8: Test Site Diagram – CURRENT Group Potomac Test Area – 9417 Kentsdale

CURRENT Technologies Potomac Test Area – 9705 Kentsdale

Location:	9705 Kentsdale, Rockville, MD
Site Description:	System installation on a utility pole in a residential neighborhood. The pole is located next to a residential street and is equipped with low-voltage wires and medium-voltage wires. Height of Bridge: 8.99m Distance to Pole: 12.80m MV-wire Height: 12.80m
Site Diagram:	See Figure 9, below
Site Photos:	See Photographs B-12 and B-13 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 30 MHz to 50 MHz, on May 2, 2008

Figure 9: Test Site Diagram – CURRENT Group Potomac Test Area – 9705 Kentsdale

CURRENT Technologies Potomac Test Area – Tuckerman

Location:	Tuckerman Lane Rockville, MD
Site Description:	System installation on a utility pole in a BPL system test area. The pole is located is an open field and is equipped with low-voltage wires and medium-voltage wires. Height of Bridge: 10.21m Distance to Pole: 13.00m MV-wire Height: 12.50m
Site Diagram:	See Figure 10, below
Site Photos:	See Photograph B-14 in Appendix B.
Tests Performed at this Location:	Radiated Emissions, 30 MHz to 50 MHz, on May 6, 2008

Figure 10: Test Site Diagram - CURRENT Group Potomac Test Area – Tuckerman

Washington Laboratories Open Area Test Site

Location:	Washington Laboratories 7560 Lindbergh Drive Gaithersburg, MD
Site Description:	Simulated system installation at an Open Area Test Site. The CURRENT Gateway-Bridge URD 6121 was mounted on a wooden platform in approximately the same position in which it would be mounted in the field, at a height of approximately 0.8 meter above the floor. The medium-voltage connections were terminated with 4' coaxial cables and 50-ohm resistors. The cables were arranged in a way that was representative of the way they would be arranged in an actual installation.
Site Diagram:	See Figure 11, below.
Tests Performed at this Location:	Radiated Emissions, 30 MHz to 1000 MHz, on February 12, 2008

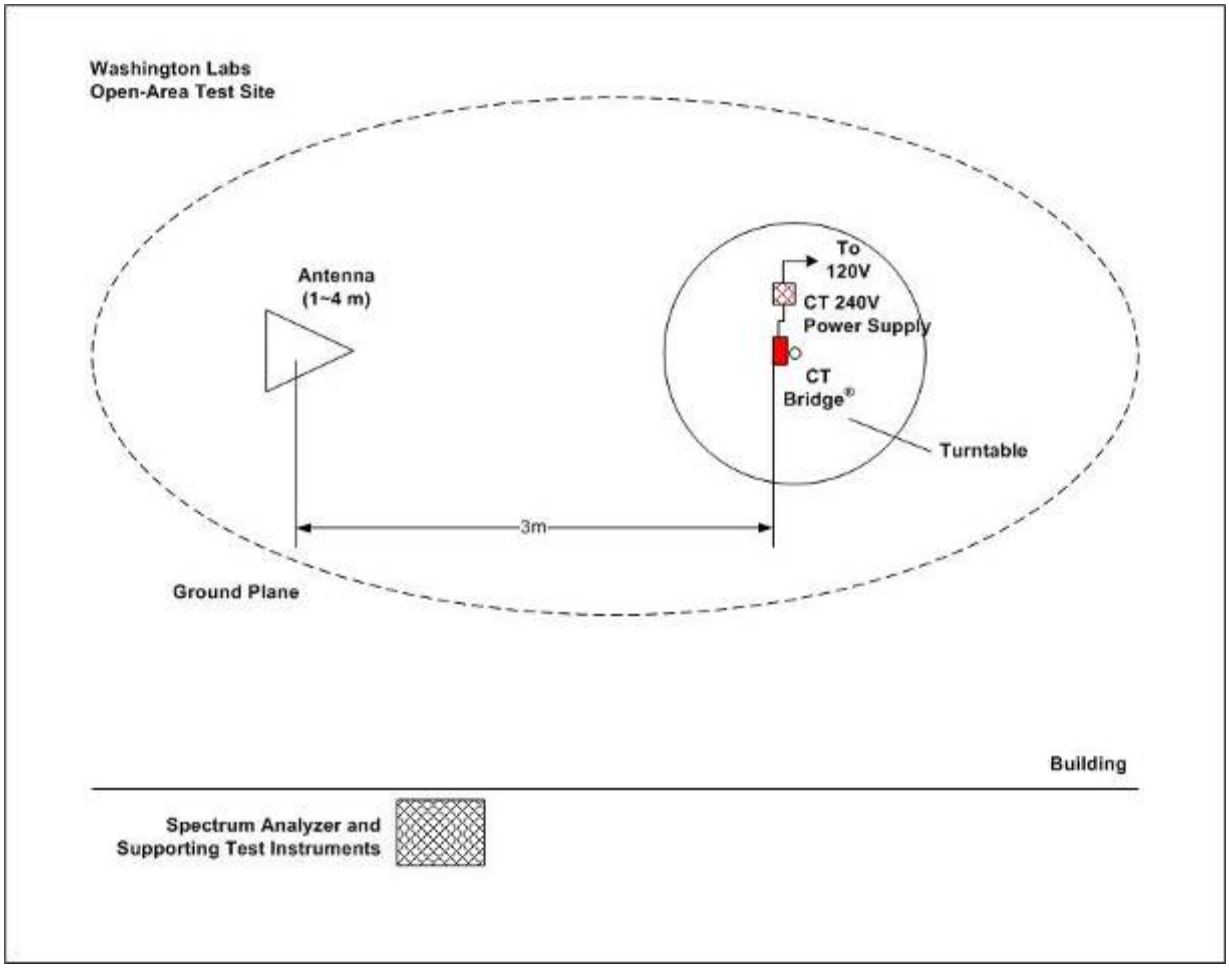

Figure 11: Test Site Diagram – Washington Laboratories Open Area Test Site

8. List of Test Equipment Used

The following is a list of test equipment used during testing.

MV Radiated Emissions Measurement – 1.705 MHz to 30 MHz

Description	Manufacturer and Model Number	Serial Number and Identification Number	Calibration Due Date
EMC Analyzer	Agilent E7405A	MY44212893	May 14, 2009
Antenna, Passive Loop	EMCO 6512	00069092	January 31, 2010
RF Cable, 125'	RG-58	CT #125	January 12, 2010

LV Radiated Emissions Measurement – 1.705 MHz to 30 MHz

Description	Manufacturer and Model Number	Serial Number and Identification Number	Calibration Due Date
EMC Analyzer	Agilent E7405A	MY45115096	February 1, 2009
Antenna, Passive Loop	EMCO 6512	00069092	January 31, 2009
RF Cable, 125'	RG-58	CT #125	January 12, 2009

MV Radiated Emissions Measurement – 30 MHz to 50 MHz

Description	Manufacturer and Model Number	Serial Number and Identification Number	Calibration Due Date
EMC Analyzer	HP E7405A	MY45115096	February 1, 2009
Antenna, Biconical	A.H. Systems SAS-540	617	August 3, 2008
RF Cable, 125'	RG-58	CT #125	January 12, 2007

Radiated Emissions Measurement – 50 MHz to 1000 MHz

Description	Manufacturer and Model Number	Serial Number and Identification Number	Calibration Due Date
Spectrum Analyzer	HP 8568B	WL #00073	July 7, 2008
Quasi-Peak Adapter	HP 85650A	WL #00069	July 7, 2008
RF Preselector (w/ OPT 8ZE)	HP 85685A	WL #00071	July 7, 2008
Antenna, Biconlog	Sunol JB1	WL #00644	November 27, 2009

9. EMI Test Results

EMI test results for both conducted and radiated emissions measurements are summarized below.

9.1 Conducted Emission Data

Conducted emissions limits do not apply to this Access BPL equipment

9.2 Radiated Emission Data

The final level of the radiated emission, in dBµV/m, is calculated by taking the reading from the spectrum analyzer (in dBµV) and adding the appropriate correction factors (antenna, cable loss, external pre-amplifier, filter, etc.). A distance correction factor is then added to compensate for the actual measurement distance being different from the specified measurement distance. The difference between this result and the FCC limit is calculated, giving the margin of compliance, as shown in Appendix A.

The field strength was calculated using the formula:

$$E(dB\mu V/m) = Vrec(dB\mu V) + AF(dB/m) + CL(dB)$$

Where Vrec is the voltage detected voltage by the spectrum analyzer, AF is the antenna factor at the specified frequency, and CL is the insertion loss on the RF cable which is connected between the antenna and the spectrum analyzer.

Conclusion: The CURRENT Gateway-Bridge OH 6030 meets the FCC limits for radiated emissions from Access BPL devices in the frequency range 1.705 MHz to 30 MHz when actively transmitting MV signals (4.4 MHz to 20.8 MHz). In this operation mode, and over this frequency range, the minimum passing margin was 3.1 dB.

The CURRENT Gateway-Bridge OH 6030 meets the FCC limits for radiated emissions from Access BPL devices in the frequency range 1.705 MHz to 30 MHz when actively transmitting LV signals (4.4 MHz to 20.8 MHz). In this operation mode, and over this frequency range, the minimum passing margin was 3.89 dB.

The CURRENT Bridge 6030 meets the FCC limits for radiated emissions from Access BPL devices in the frequency range 30 MHz to 50 MHz when actively transmitting MV signals (31.4 MHz to 47.9 MHz). In this operation mode, and over this frequency range, the minimum passing margin was 10.6 dB.

The CURRENT Gateway-Bridge URD 6030 meets the Part 15 Class A radiated emission requirements over the frequency range 50 MHz to 1000 MHz. Over this frequency range, the minimum passing margin was 17.1 dB.