E. Test Results: Metric Replication (PMR5)

1.0 Description

The purpose of the Metric Replication (PMR5) test was to evaluate Verizon Pennsylvania's (Verizon PA's) process for computing Metric values by attempting to recreate the values of performance metrics using data from Verizon PA's target database. This process tested Verizon PA's policies and procedures for reporting Metric values. This test used mathematical techniques to verify and validate the values of Verizon PA's performance metrics in Pre-Ordering, Ordering, Provisioning, Maintenance & Repair, Billing, Network Performance, Operator Services and Databases, and General.

2.0 Methodology

This section summarizes the test methodology.

2.1 Business Process Description

Verizon PA produced on a monthly basis a Carrier-to-Carrier Report based on the Carrier-to-Carrier Guidelines. Please see PMR3 (Development and Documentation of Standards and Definitions Verification and Validation Review) for an overview of these Carrier-to-Carrier Guidelines. These Carrier-to-Carrier Reports contained averages, percentages, observation counts, standard deviations, sampling errors, and z-scores.

Verizon PA also produced technical documentation of the algorithms and variables that Verizon PA used to calculate Metrics. This technical documentation is evaluated in PMR3 (Development and Documentation of Standards and Definitions Verification and Validation Review).

2.2 Scenarios

Scenarios were not applicable to this test.

2.3 Test Targets & Measures

The test target was the replication of metric values. Processes, sub-processes, evaluation measures, and associated test cross-reference numbers are summarized in Table 5-1 which follows. The last column, "Test Cross-Reference," indicates where the particular measures are addressed in Section 3.1 "Results & Analysis."

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Table 5-1: Test Target Cross-Reference

Process	Sub-Process	Evaluation Measure	Test Cross-Reference
Metric Replication	Reproduction of desired metric	Ability to reproduce desired metrics	PMR-5-1-1, PMR-5-1-2, PMR-5-1-3
Metric Replication	Reporting of results	Adequacy and completeness of reporting policies	PMR-5-2-1

2.4 Data Sources

The data collected for the test are summarized in Table 5-2 below.

Table 5-2: Data Sources for Metric Replication

Document	File Name	Location in Workpapers	Source
Verizon PA Original Data – Pre-Ordering	Various	PMR-5-A-I (Verizon PA PMR5 Workpapers CD #1)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Pre-Ordering	Various	PMR-5-A-II (Verizon PA PMR5 Workpapers CD #1)	KPMG Consulting
Verizon PA Original Data – Ordering	Various	PMR-5-B-I (Verizon PA PMR5 Workpapers CD #2)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Ordering	Various	PMR-5-B-II (Verizon PA PMR5 Workpapers CD #2)	KPMG Consulting
Verizon PA Original Data – Provisioning	Various	PMR-5-C-I (Verizon PA PMR5 Workpapers CD #3)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Provisioning	Various	PMR-5-C-II (Verizon PA PMR5 Workpapers CD #3)	KPMG Consulting
Verizon PA Original Data – Maintenance and Repair	Various	PMR-5-D-I (Verizon PA PMR5 Workpapers CD #4)	Verizon PA

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Document	File Name	Location in Workpapers	Source
KPMG Consulting Programs/Code/ Analysis – Maintenance and Repair	Various	PMR-5-D-II (Verizon PA PMR5 Workpapers CD #4)	KPMG Consulting
Verizon PA Original Data – Billing	Various	PMR-5-E-I (Verizon PA PMR5 Workpapers CD #5)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Billing	Various	PMR-5-E-II (Verizon PA PMR5 Workpapers CD #5)	KPMG Consulting
Verizon PA Original Data – Network Performance	Various	PMR-5-F-I (Verizon PA PMR5 Workpapers CD #5)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Network Performance	Various	PMR-5-F-II (Verizon PA PMR5 Workpapers CD #5)	KPMG Consulting
Verizon PA Original Data – Operator Services and Databases	Various	PMR-5-G-I (Verizon PA PMR5 Workpapers CD #5)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – Operator Services and Databases	Various	PMR-5-G-II (Verizon PA PMR5 Workpapers CD #5)	KPMG Consulting
Verizon PA Original Data – General	Various	PMR-5-H-I (Verizon PA PMR5 Workpapers CD #5)	Verizon PA
KPMG Consulting Programs/Code/ Analysis – General	Various	PMR-5-H-II (Verizon PA PMR5 Workpapers CD #5)	KPMG Consulting
Statistical Analysis – Data/Code/Analysis	Various	PMR-5-I-I (Verizon PA PMR5 Workpapers CD #6)	KPMG Consulting
Assorted Documents – Carrier-to-Carrier Reports/Carrier-to-Carrier Guidelines/ Observations/ Exceptions/etc…	Various	PMR-5-J-I (Verizon PA PMR5 Workpapers CD #6)	Various

2.4.1 Data Generation/Volumes

This test did not rely on data generation or volume testing.

2.5 Evaluation Methods

KPMG Consulting created its own programs/code to replicate the values on the Carrier-to-Carrier Reports. The result of this type of analysis was a quantitative evaluation: determining if the values as produced by KPMG Consulting match the values in the Carrier-to-Carrier Reports. KPMG Consulting used the September 2000 Hybrid Carrier-to-Carrier Report as the baseline for this analysis.

Based on the Hybrid Carrier-to-Carrier Reports, data, and algorithms, KPMG Consulting attempted to verify whether the Metric values were accurate and in accordance with the Hybrid Carrier-to-Carrier Guidelines.

KPMG Consulting also verified the accuracy of the September 2000 Hybrid Carrier-to-Carrier Report. Using discrepancies identified during replication, KPMG Consulting tried to determine if these discrepancies demonstrated inaccuracies on the September 2000 Hybrid Carrier-to-Carrier Report by investigating the reasons for the discrepancies.

2.6 Analysis Methods

The Metric Replication review included a checklist of evaluation criteria developed by the Test Manager during the initial phase of the Verizon Pennsylvania OSS Evaluation. These evaluation criteria provided the framework of norms, standards, and guidelines for the Metric Replication review.

The data collected were analyzed employing the evaluation criteria referenced above.

3.0 Results Summary

This section identifies the evaluation criteria and test results.

3.1 Results & Analysis

The results of this test are presented in Tables 5-3 through 5-10 below.

Table 5-3: PMR5 Evaluation Criteria and Results: Pre-Ordering

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-A	The metrics values as reported by Verizon PA are replicable.	Not Satisfied	KPMG Consulting was able to match all Pre-Ordering (PO) values in the September Hybrid Carrier-to-Carrier Report except for: ♦ PO-2-03 (OSS Interface Availability – Non-Prime Time - Electronic Bonding – Maintenance) CLEC; ♦ PO-3-01 (Average Speed of Answering – Ordering); and ♦ PO-3-02 (% Answered within 30 Seconds – Ordering). This represents 6.38% of all reported Pre-Ordering values.
PMR-5-1-2-A	The metrics observation counts are replicable.	Not Satisfied	KPMG Consulting was able to match all Pre-Ordering observation counts in the September Hybrid Carrier-to-Carrier Report except for: ♦ PO-2-02 (OSS Interface Availability – Prime Time - Electronic Bonding – Maintenance) CLEC; and ♦ PO-2-03 (OSS Interface Availability – Non-Prime Time - Electronic Bonding – Maintenance) - CLEC. This represents 15.38% of all reported Pre-Ordering observation counts.
PMR-5-1-3-A	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	KPMG Consulting found that Verizon PA's calculations of Pre-Ordering metrics values are consistent with the descriptions detailed in the Hybrid Carrier-to-Carrier Guidelines.

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Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-2-1-A	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Not Satisfied	Based on the inaccurate values and observation counts reported in the September Hybrid Carrier-to-Carrier Report, KPMG Consulting determined that this report was not accurate or complete with respect to Pre-Ordering metrics.

Table 5-4: PMR5 Evaluation Criteria and Results: Ordering

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-B	The metrics values as reported by Verizon PA are replicable.	Satisfied	KPMG Consulting was able to match all Ordering values in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-2-B	The metrics observation counts are replicable.	Satisfied	KPMG Consulting was able to match all Ordering observation counts in the September Hybrid Carrier-to-Carrier Report except for: ♦ OR-2-04 (% On Time LSR Reject < 10 lines – Electronic – No Flow-Through) UNE 2 Wire xDSL; and ♦ OR-4-02 (Completion Notice – % On Time). This represents 3.44% of all reported Ordering observation counts.
PMR-5-1-3-B	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	Verizon PA's calculations of Ordering metric values were consistent with the descriptions as detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-B	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Satisfied	The September Hybrid Carrier-to-Carrier Report was adequate and complete with respect to Ordering metrics.

Table 5-5: PMR5 Evaluation Criteria and Results: Provisioning

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-C	The metrics values as reported by Verizon PA are replicable.	Satisfied	KPMG Consulting was able to match all Provisioning (PR) values in the September Hybrid Carrier-to-Carrier Report except for: ♦ PR-6-01 (% Installation Troubles reported within 30 Days) Retail Special Services and UNE Specials Services; and ♦ PR-6-03 (% Installation Troubles reported within 30 Days – FOK/TOK/CPE) Retail Special Services. This represents 0.14% of all reported Provisioning values.
PMR-5-1-2-C	The metrics observation counts, standard deviations and z-scores are replicable.	Satisfied	KPMG Consulting was able to match all Provisioning observation counts in the September Hybrid Carrier-to-Carrier Report. KPMG Consulting was able to match all Provisioning standard deviations in the September Hybrid Carrier-to-Carrier except for: ♦ PR-4-02 (Average Delay Days – Total). This represents 0.19% of all reported Provisioning standard deviations. KPMG Consulting was able to match all Provisioning z-scores in the September Hybrid Carrier-to-Carrier Report except for: ♦ PR-6-01 (% Installation Troubles reported within 30 Days) - Retail Special Services and UNE Special Services. This represents 0.33% of all reported Provisioning z-scores.

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-3-C	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Not Satisfied	Metric PR-6 (Installation Quality) does not follow the Hybrid Carrier-to-Carrier Guidelines. The numerator measures installation troubles based on a rolling basis while the denominator measures the number of installations in the reporting month. Please note that the Pa. PUC has recently adopted a revised definition for PR-6 in the permanent PA metrics which is now consistent with the calculation as performed by Verizon PA.
PMR-5-2-1-C	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Satisfied	KPMG Consulting determined that the September Hybrid Carrier-to-Carrier Report was adequate and complete with respect to Provisioning metrics.

Table 5-6: PMR5 Evaluation Criteria and Results: Maintenance and Repair

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-D	The metrics values as reported by Verizon PA are replicable.	Not Satisfied	KPMG Consulting was able to match all Maintenance and Repair (MR) values in the September Hybrid Carrier-to-Carrier Report except for: ♦ MR-1-01 (Average Response Time – Create Trouble – Web GUI) – Retail; ♦ MR-1-01 (Average Response Time – Create Trouble – Electronic Bonding) – Retail; ♦ MR-1-02 (Average Response Time – Status Trouble – Web GUI) – Retail; ♦ MR-1-02 (Average Response Time – Status Trouble – Electronic Bonding) – Retail; ♦ MR-1-03 (Average Response Time – Modify Trouble – Web GUI) – Retail; ♦ MR-1-03 (Average Response Time – Modify Trouble – Electronic Bonding) – Retail; ♦ MR-1-04 (Average Response Time – Request Cancellation of Trouble – Web GUI) – Retail; ♦ MR-1-04 (Average Response Time – Request Cancellation of Trouble – Electronic Bonding) – Retail; ♦ MR-2-01 (Network Trouble Report Rate – Total) – Retail Trunks; ♦ MR-2-02 (Network Trouble Report Rate – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western; ♦ MR-2-03 (Network Trouble Report Rate – Central Office – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western; ♦ MR-2-05 (% CPE/TOK/FOK

Test Cross-Reference	Evaluation Criteria	Result	Comments
			Trouble Report Rate – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western; ♦ MR-4-01 (Mean Time To Repair – Total) – Retail Trunks; ♦ MR-4-05 (% Out of Service > 2 Hours) – Retail Trunks; and ♦ MR-4-06 (% Out of Service > 4 hours) – Retail Trunks and UNE Special Services. While this represents only 2.77% of all reported Maintenance and Repair values, there were discrepancies for 56.25% of all those reported Maintenance and Repair Trunks metrics that were reported on the September Hybrid Carrier-to-Carrier Report.

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-2-D	The metrics observation counts, standard deviations, and z-scores are replicable.	Not Satisfied	KPMG Consulting was able to replicate all Maintenance and Repair observation counts in the September Hybrid Carrier-to-Carrier Report except for: ♦ MR-4-01 (Mean Time To Repair – Total) – Retail Trunks; ♦ MR-4-04 (% Cleared (all troubles) within 24 Hours) – Retail Trunks; ♦ MR-4-05 (% Out of Service > 2 Hours) – Retail Trunks; ♦ MR-4-06 (% Out of Service > 4 hours) – Retail Trunks; ♦ MR-4-07 (% Out of Service > 12 hours) – Retail Trunks; and ♦ MR-4-08 (% Out of Service > 24 Hours) – Retail Trunks. While this represents only 0.54% of all reported Maintenance and Repair observation counts, there were discrepancies for 37.5% of all those reported Maintenance and Repair Trunks observation counts. KPMG Consulting was able to match all standard deviations in the September Hybrid Carrier-to-Carrier Report. KPMG Consulting was able to match all z-scores in the September Hybrid Carrier-to-Carrier Report except for: ♦ MR-2-01 (Network Trouble Report Rate – Total) – Retail Trunks; ♦ MR-2-02 (Network Trouble Report Rate – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western; ♦ MR-2-03 (Network Trouble Report Rate – Central Office – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western;

Test Cross-Reference	Evaluation Criteria	Result	Comments
			♦ MR-2-05 (% CPE/TOK/FOK Trouble Report Rate – Platform) – UNE POTS – State, Philadelphia, Eastern-North, Eastern-South, Central, Western; ♦ MR-4-01 (Mean Time To Repair – Total) – Retail Trunks; ♦ MR-4-05 (% Out of Service > 2 Hours) – Retail Trunks; and ♦ MR-4-06 (% Out of Service > 4 hours) – Retail Trunks and UNE Special Services. This represents 5.86% of all reported Maintenance and Repair z-scores.
PMR-5-1-3-D	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	KPMG Consulting found that Verizon PA's calculations of Maintenance and Repair metrics values are consistent with the descriptions detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-D	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Not Satisfied	Based on the inaccurate values, observation counts, and z-scores reported in the September Hybrid Carrier-to-Carrier Report, KPMG Consulting determined that this report was not accurate or complete with respect to Maintenance and Repair metrics.

Table 5-7: PMR5 Evaluation Criteria and Results: Billing

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-E	The metrics values as reported by Verizon PA are replicable.	Not Satisfied	KPMG Consulting was able to match all Billing (BI) metrics in the September Hybrid Carrier-to-Carrier Report except for: ♦ BI-1-01 (% DUF in 3 Business Days) – CLEC; ♦ BI-1-02 (% DUF in 4 Business Days) – CLEC; ♦ BI-1-03 (% DUF in 5 Business Days) – CLEC;

Test Cross-Reference	Evaluation Criteria	Result	Comments
			♦ BI-1-04 (% DUF in 8 Business Days) – CLEC; and ♦ BI-2-01 (Timeliness of Carrier Bill) – CLEC. This represents 31.25% of all reported Billing values.
PMR-5-1-2-E	The metrics observation counts are replicable.	Not Satisfied	KPMG Consulting was able to match all Billing observation counts in the September Hybrid Carrier-to-Carrier Report except for: ♦ BI-2-01 (Timeliness of Carrier Bill) – CLEC. This represents 11.11% of all reported Billing observation counts.
PMR-5-1-3-E	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	Verizon PA's calculations of Billing metric values were consistent with the descriptions as detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-E	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Not Satisfied	Based on the inaccurate values and observation counts reported in the September Hybrid Carrier-to-Carrier Report, KPMG Consulting determined that this report was not accurate or complete with respect to Billing metrics.

Table 5-8: PMR5 Evaluation Criteria and Results: Network Performance

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-F	The metrics values as reported by Verizon PA are replicable.	Not Satisfied	KPMG Consulting was able to match all Network Performance (NP) values in the September Hybrid Carrier-to-Carrier Report except for: ♦ NP-2-05 (% On Time – Physical Collocation) – CLEC Trunks; and ♦ NP-2-07 (Average Delay Days – Physical Collocation) – CLEC Trunks. This represents 14.29% of all reported Network Performance values.
PMR-5-1-2-F	The metrics observation counts are replicable.	Satisfied	KPMG Consulting was able to match all Network Performance observation counts in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-3-F	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	Verizon PA's calculations of Network Performance metric values were consistent with the descriptions as detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-F	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Not Satisfied	Based on the inaccurate values reported in the September Hybrid Carrier-to-Carrier Report, KPMG Consulting determined that this report was not accurate or complete with respect to Network Performance metrics.

Table 5-9: PMR5 Evaluation Criteria and Results: Operator Services and Databases

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-G	The metrics values as reported by Verizon PA are replicable.	Satisfied	KPMG Consulting was able to match all Operator Services and Databases values in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-2-G	The metrics observation counts are replicable.	Satisfied	KPMG Consulting was able to match all Operator Services and Databases observation counts reported in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-3-G	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	Verizon PA's calculations of Operator Services and Databases metric values were consistent with the descriptions as detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-G	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Satisfied	Based on its analysis, KPMG Consulting determined that the September Hybrid Carrier-to-Carrier Report was adequate and complete with respect to Operator Services and Databases metrics.

Table 5-10: PMR5 Evaluation Criteria and Results: General

Test Cross-Reference	Evaluation Criteria	Result	Comments
PMR-5-1-1-H	The metrics values as reported by Verizon PA are replicable.	Satisfied	KPMG Consulting was able to match all General values in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-2-H	The metrics observation counts are replicable.	Satisfied	KPMG Consulting was able to match all General observation counts reported in the September Hybrid Carrier-to-Carrier Report.
PMR-5-1-3-H	Verizon PA's calculations of metrics values are consistent with the descriptions as detailed in the Carrier-to-Carrier Guidelines.	Satisfied	Verizon PA's calculations of General metric values were consistent with the descriptions as detailed in the Hybrid Carrier-to-Carrier Guidelines.
PMR-5-2-1-H	Verizon PA Carrier-to-Carrier Reports are adequate and complete.	Satisfied	Based on its analysis, KPMG Consulting determined that the September Hybrid Carrier-to-Carrier report was adequate and complete with respect to General metrics.