

**THIRD-PARTY TESTING OF OPERATIONAL SUPPORT SYSTEMS:
BACKGROUND AND RELATED MATERIALS**

Frank P. Darr
Senior Research Specialist

The National Regulatory Research Institute
1080 Carmack Road
Columbus, Ohio 43210-1002
Website: www.nrri.ohio-state.edu

August 1999

This Report was prepared by the National Regulatory Research Institute (NRRI). Funding was provided by the member commissions of the National Association of Regulatory Utilities Commissioners (NARUC). The opinions expressed herein are the author's and do not necessarily reflect the views, opinions, or policies of the NRRI, the NARUC, or any NARUC-member commission.

TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------|
| Overview | 1 |
| Summary of Report | 1 |
| Other Materials | 2 |
| FCC Review Standards and Decisions Regarding OSS | 3 |
| Summary | 3 |
| FCC Legal Structure for OSS Review | 3 |
| FCC Reviews of Section 271 Applications for OSS Parity | 6 |
| Functionality | 6 |
| Capacity and Scalability | 8 |
| Supporting Documentation | 8 |
| New York OSS Testing | 10 |
| Background of New York OSS Review | 10 |
| Overview of the New York Approach | 11 |
| The Virtual CLEC | 11 |
| OSS Testing | 12 |
| Domains | 13 |
| Testing Standards | 14 |
| The Texas OSS Testing Approach | 14 |
| Background of Texas OSS Testing | 14 |
| The Texas Master Test Plan: Overview | 15 |
| Functional Testing | 16 |
| Capacity Testing | 17 |
| Performance Standards | 17 |
| Performance Measures | 18 |
| Viewing the CD-ROM | 19 |
| Documents on the CD-ROM | 20 |

Overview

This report and CD-ROM provide materials that have been developed in the review of Operational Support Systems (OSS). When this report was prepared during the summer of 1999, the FCC had reviewed several section 271 applications and defined standards that would govern its review of OSS, and New York and Texas had neared the completion of their OSS testing. Several other states had begun their own tests based on the New York and Texas models. Other states, including a joint effort by several served by U S WEST, were planning testing efforts. In an attempt to assist commissions in this process, this report summarizes and collects many of the important documents defining legal standards and the testing that has taken place.

Summary of Report

OSS are the elements a telephone company uses to provision services to its customers, whether these are its own retail customers or competing telephone companies. These services include support for pre-ordering, ordering, provisioning, repair and maintenance, and billing.

As part of the process to permit a regional Bell operating company to enter the interLATA in-region long distance market, the Federal Communications Commission (FCC) has required the applicant to demonstrate that it can provide OSS either at the same level that it provides those services to itself or, in the case of services that the company would not provide itself, at a level that would permit an efficient new entrant to compete with the incumbent. Normally, the ability of the company to provide OSS would be measured by actual performance. The FCC, however, has recognized that the results of third-party testing may be used to demonstrate that the OSS are commercially ready.

Two distinct approaches to OSS third-party testing have developed. To evaluate Bell Atlantic-New York's (BA) compliance with section 271 of the Telecommunications Act of 1996, the New York commission approved the creation of a virtual competitive local exchange carrier (CLEC) and is using it to determine if the company is providing sufficient OSS resources to wholesalers.

The Texas commission's review of SWB consists of two parts. The first part assesses the functional capabilities of the OSS. It requires SWB to demonstrate that it can provide pre-ordering, ordering, provisioning, billing, and maintenance and repair through its current OSS. The second part examines the robustness of the computer systems. It requires SWB to demonstrate that its computer systems can handle the expected customer requests for order and pre-order information, estimated at first quarter 2000 levels. The test is being conducted using the services of SWB, several competitors, commission staff, and a third-party administrator. SWB collected the data and provided it to the administrator for evaluation. The administrator determined whether the systems meet the previously agreed-to performance criteria.

Inherent in the testing is a determination that the various operations meet certain performance standards. Both the FCC and various state commissions have proposed or adopted standards to measure the performance of the incumbent. These standards, however, go well beyond the provision of pre-order, order, provisioning, billing, and maintenance functions that make up the core of the OSS activities. Also included in the various standards are provisions for system performance, collocation, directory assistance, and other items key to the introduction of new services.

Other Materials

This report includes a CD-ROM. The CD-ROM contains a copy of this report and most of the references in the report. It also includes materials that have some direct relation to OSS in the quickly changing telecommunications market. The instructions to view the CD-ROM are found on the last page of this report.

FCC Review Standards and Decisions Regarding OSS

Summary

For its review applications seeking relief from the lines of business restrictions contained in the Telecommunications Act of 1996, the FCC has stated that the incumbent has the burden to demonstrate that the OSS are competitively neutral. For those services the incumbent provides itself and competitors, the applicant must show parity of service. For those services that are not analogous, the incumbent must offer services that would permit an efficient competitor a meaningful opportunity to compete. The FCC has been particularly interested in demonstrations of commercial usage and data concerning real market activities, but it will consider third-party testing as a substitute if commercial data are not available. The data must demonstrate that the OSS are providing those services competitors need to operate, and the OSS are sufficiently robust to handle current and reasonably expected demands by competitors. Moreover, the FCC requires a demonstration that competitors can receive these services and the services are being performed in substantially the same way the incumbent performs them for itself.

FCC Legal Structure for OSS Review

To secure relief from the section 271 restrictions, a regional Bell operating company (RBOC) must demonstrate to the FCC it has opened its systems to competitors so that they may compete in the local exchange market.¹ To satisfy the Commission, an RBOC must prove that it is providing nondiscriminatory access to the network element of OSS and the OSS necessary to provide resale required by section 251(c)(3) and (4) of the Act.²

¹ Telecommunications Act of 1996 § 271(c)(2)(B)(ii) (unbundled network elements) and (xiv) (resale).

² Application of BellSouth Corp., BellSouth Telecommunications, Inc., BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Service in Louisiana, FCC Order No. 98-271 ¶ 83 (1998) (hereinafter as *BellSouth LA*).

The rationale for this approach is competitive parity. As the FCC stated in the second *BellSouth Louisiana* order, “The Commission consistently has found that nondiscriminatory access to these systems, databases, and personnel is integral to the ability of competing carriers to enter the local exchange market and compete with the incumbent [local exchange company]. New entrants must be able to provide service to their customers at a quality level that matches the service provided by the incumbent [local exchange company] to compete effectively in the local exchange market.”³

In making its review of an applicant's OSS compliance, the FCC will consider two elements. First, the company must demonstrate that it has the necessary systems and personnel to provide each of the OSS components and has provided the competitors with sufficient information so that the competitors can use the systems. Second, the FCC will determine if the systems are operationally ready. “Under the second part of the inquiry, the Commission examines performance measurements and other evidence of commercial readiness.”⁴ The company must demonstrate that it offers “access to competing carriers that is equivalent to the access the [company] provides itself in the case of OSS functions that are analogous to OSS functions that a [company] provides to itself. ... For those OSS functions that have no retail analogue (such as ordering and provision of unbundled network elements), a [company] must offer access sufficient to allow an efficient competitor a meaningful opportunity to compete.”⁵

The FCC has recognized two kinds of evidence to demonstrate that a company has complied with the OSS requirement. The primary evidence is actual commercial usage. The FCC will consider evidence both from the state for which the application is being made and other states in the company's service region. The company may also demonstrate commercial readiness through “carrier-to-carrier testing, independent

³ Id., ¶ 83.

⁴ Id., ¶ 85.

⁵ Id., ¶ 87.

third-party testing, and internal testing, in the absence of commercial usage.⁶ In its application, the FCC will consider whether the data is complete, sufficiently disaggregated, and statistically valid.⁷

In its proposed rule making on performance measurements, the FCC particularly emphasized the need for statistically valid results. It stated:

We recognize that reporting averages of performance measurements alone, without further analysis, may not reveal whether there are underlying differences in the way incumbent [companies] treat their own retail operations in relation to the way they treat competing carriers. Consequently, we propose, as part of the model rules proposed herein, the use of statistical tests to determine whether measured differences in the average performance of incumbent [companies] toward their retail customers and toward competing carriers represent true differences in behavior rather than random chance.⁸

Further, the FCC encouraged the use of reporting to promote disclosure and the provision of high-quality OSS.⁹

Apart from the guidance that the FCC has provided in the section 271 decisions, there are no “federal standards” for performance apart from parity and the provision of such systems that will allow an efficient competitor to enter the market. Although the FCC sought to guide the states in the adoption of performance standards through its standards rulemaking, it did not adopt explicit standards of performance.¹⁰ Thus, it is left to a state to

⁶ Id., ¶ 86. As noted below, internal testing has not been given much weight.

⁷ Id., ¶ 92.

⁸ In the Matter of Performance Measurements and Reporting Requirements for Operations Support Systems, Interconnection, and Operator Services and Directory Assistance, Notice of Proposed Rulemaking, CC Docket No 98-56 ¶ 34 (Apr. 17, 1998).

⁹ Id., ¶¶ 13 & 18.

¹⁰ Id., ¶ 18. The FCC also endorsed an order issued by the Louisiana commission that directed BellSouth to develop performance measurements for those functions it must provide to competing carriers that it does not provide to its retail customers. *BellSouth LA*, supra note 2, ¶ 93 (citing *BellSouth*

determine in the first instance the relevant level of performance it desires before it indicates its approval of a company's section 271 application.

FCC Reviews of Section 271 Applications for OSS Parity

In the reviews that the FCC has completed, at least three general areas of concern have emerged. First, the FCC has found that these applications failed to demonstrate that OSS have provided comparable functionality to the competitors. Second, the Commission has concluded the incumbents have not demonstrated that the systems are commercially ready for the expected large volumes of new customers. Inherent in these findings is the third matter: The incumbents have not provided sufficient or meaningful data in many cases to demonstrate that their systems are functional and nondiscriminatory.

Functionality

The FCC has repeatedly found that the applications did not demonstrate that the OSS was fully and comparably functional. The FCC has stated that OSS must support all modes of entry permitted under the law.¹¹ Further, it is not enough that an interface is generally available to the competitors on a nondiscriminatory basis; rather, the system in place will be reviewed from end-to-end.¹² The system available to the competitor must perform in substantially the same manner for the competitors and the incumbent.¹³ Thus, if the incumbent's order is processed electronically, the competitor must receive similar

Telecommunications, Inc, Service Quality Performance Measurements, Docket No. U-22252 (Subdocket-C), General Order (adopted Aug. 31, 1998).

¹¹ Application of Ameritech Michigan Pursuant to section 271 of the Telecommunications Act of 1934, as amended, to Provide In-Region, InterLATA Services in Michigan, Memorandum Opinion and Order, CC Docket No. 97-137 ¶ 133 (Aug. 19, 1997) (hereinafter as *Ameritech Michigan*).

¹² *Id.*, ¶¶ 134-35.

¹³ *Id.*, ¶ 135.

treatment.¹⁴ Moreover, the incumbent must provide competitors with the business rules that are used to operate the systems so as to avoid unfair advantage to the incumbent.¹⁵

Over-reliance on manual treatment of competitor orders has been a frequent problem in these applications.¹⁶ The FCC criticized the BellSouth South Carolina application, for example, because of the difference in manual treatment of rejections. The company provided nearly immediate rejection notices to itself through its computer system while it provided facsimile notice to the competitors. The difference resulted in substantial delays in the notices provided to competitors.¹⁷ Pre-ordering functions were similarly affected by the differences between the computer interface provided to competitors and the one the company used.¹⁸ This problem was further compounded by the company's failure to assist the competitors in integrating their software platforms with that of BellSouth.¹⁹

Unbundled network elements present a different problem because the applicant does not provide an analogous product to itself. The FCC requires specific data that these functions are commercially available,²⁰ including the sale of combinations of unbundled network elements and complex orders such as orders including special directory listings.²¹

¹⁴ *Id.*, ¶ 137.

¹⁵ In the Matter of BellSouth Corporation Pursuant to section 271 of the Communications Act of 1934, as amended, to Provide In-Region, InterLATA Services in South Carolina, Memorandum Opinion and Order, CC Docket No. 97-208 ¶ 111 (Dec. 24, 1997) (hereinafter as *BellSouth SC*).

¹⁶ See, e.g., *Ameritech Michigan*, supra note 11, ¶¶ 172-99.

¹⁷ *BellSouth SC*, supra note 15, ¶¶ 116-18.

¹⁸ *Id.*, ¶¶ 150-79.

¹⁹ *Id.*, ¶ 151.

²⁰ *BellSouth LA*, supra note 2, ¶ 140.

²¹ *Id.*, ¶¶ 141 and 144.

The FCC has also reviewed repair and maintenance and billing activities to determine that the competitors are receiving comparable treatment.²² Differential response times in repair and maintenance and errors resulting in double billing have resulted in negative findings.²³

Capacity and Scalability

Throughout the reviews, the FCC has raised concerns about the capacity and scalability of incumbents' OSS support. In the *Ameritech Michigan* order, for example, the Commission noted serious concerns with the Ameritech system's heavy reliance on manual order processing because manual treatment would lead to increased backlogs and difficulties in increased staffing as orders increased.²⁴ High rejection rates and system failures raised similar doubts about the application by BellSouth-South Carolina.²⁵ The Commission took the view that these applications must contain evidence that the systems can provide the services that competitors are likely to need, and they must also provide it at current and expected levels.

Supporting Documentation

The final theme often repeated in these orders is the need for reliable data to support the claims that the OSS are providing comparable service. In the *Ameritech Michigan* order, for example, the FCC stated that performance measures must be clear and explained, that the data must be collected that support the claim whether or not they were normally collected by the company, and the performance measures must be

²² *Id.*, ¶¶ 147-57 and 160.

²³ *Id.*

²⁴ *Ameritech Michigan*, supra note 11, ¶ 172-99.

²⁵ *BellSouth SC*, supra note 15, ¶¶ 103 & 180-81.

specific.²⁶ To that end, the FCC encouraged independent third-party review as a source of information.²⁷ In a subsequent case, the FCC has further encouraged the use of testing in those instances in which there is little or no commercial activity, e.g. unbundled network element provisioning.²⁸ In contrast, internal testing to support an assertion of readiness has been given little weight.²⁹

Resale installation rates, probably because of their immediate importance, have received special attention. In the *Ameritech Michigan* decision, the FCC stated that it would look for the company's demonstration that average installation times for resale provisioning were comparable with the company's retail provisioning.³⁰ In the *BellSouth South Carolina* order, the FCC went on to state that the time should be measured from the receipt of the order to installation.³¹ Attempts to circumvent this measurement by showing the number of orders completed within a certain amount of time were rejected as a possible mask for discrimination.³²

There has not as yet been discussion of the appropriate statistical tests to differentiate real and spurious differences in performance in the section 271 cases. This is likely because the differences that have been identified have been clearly and substantially different.³³ Thus, BellSouth's second Louisiana application faced a significant barrier when its own data reported electronic processing of its orders of 82

²⁶ *Ameritech Michigan*, supra note 11, ¶¶ 204-13.

²⁷ *Id.*, ¶ 216.

²⁸ *BellSouth LA*, supra note 2, ¶ 140.

²⁹ *Ameritech Michigan*, supra note 11, ¶ 161.

³⁰ *Id.*, ¶¶ 164-71.

³¹ *BellSouth SC*, supra note 15, ¶ 137.

³² *Id.*, ¶¶ 134-37.

³³ The *BellSouth-Second Louisiana* order contains several examples such as substantially longer times to effect repairs and higher repeat complaints for repairs. *BellSouth LA*, supra note 2, ¶ 147.

percent to 96 percent and those of competitors at 34 percent.³⁴ Similarly, the FCC was not impressed that 80 percent of rejection notices for competitors had to be manually keyed before they were sent.³⁵

The greater problem, however, is the incomplete nature of many applications. Each of the orders discusses the need for the company to demonstrate that it is prepared through historic performance or studies, and not promises or post-application improvements. The applications have been criticized for being incomplete.³⁶

New York OSS Testing

Background of New York OSS Review

In February 1997, New York Telephone Co. (subsequently Bell Atlantic or BA) filed with the New York Public Service Commission a request that it support BA's section 271 application. The CLECs opposed the application, arguing that BA was not in compliance with the requirements of section 271. In July 1997, an administrative law judge agreed with the CLECs and concluded that BA failed to demonstrate that it complied with several of the fourteen checklist items and failed in particular to demonstrate that its operational support systems for itself and competitors were in parity.³⁷ BA later that year filed a supplemental petition in response to the failures identified in the July entry. In the meantime, the parties began a collaboration to address OSS issues. An administrative law judge in December 1997 recommended the continuation of the collaboration.

³⁴ Id., ¶ 109.

³⁵ Id., ¶ 118.

³⁶ E.g., id., ¶¶ 122-23, 130, & 133.

³⁷ Petition of New York Tel. Co. For Approval of its Statement of Generally Available Terms and Conditions and Draft Filing of Petition for InterLATA Entry, Ruling Concerning Status of Record, Case No. 97-C-0271 (July 8, 1997).

BA entered three commitments concerning OSS in April 1998.³⁸ First, it agreed to several performance standards for its OSS. Second, it agreed to participate in third-party testing. Finally, it agreed to post-entry audits to assure that it continued to meet performance standards as volumes of orders increased. In anticipation of these commitments, the commission issued a request for proposals for testing and test evaluation on March 6, 1998. Subsequently, on May 15, 1998, it issued a second request for proposals for a vendor to construct interface software.³⁹ KPMG won the March request for proposals for test design and evaluation, and Hewlett Packard successfully bid for the creation of the software.

Overview of the New York Approach

The New York test addresses several concerns. First, it measures the quality of the documentation and other support provided to CLECs for the construction of an interface. Second, it measures the functionality and capacity of the BA OSS. Third, it measures the commitment of BA to the wholesalers with whom it is both vendor and competitor.

The Virtual CLEC

The first aspect of the test was to determine if the materials prepared by BA would allow a CLEC to prepare a software interface that would work with the BA systems. HP contracted to create a CLEC Test Transaction Generator (CTTG). The CTTG was designed based on materials provided by BA and available to all CLECs.⁴⁰ To prepare the product, HP identified a five-step process that a CLEC would have to undertake to connect to the BA OSS. These steps included receipt of state regulatory approval, establishment of a business relationship with BA, establishment of interconnection with

³⁸ Id., Pre-Filing Statement of Bell Atlantic-New York (Apr. 6, 1998).

³⁹ The requests for proposals and BA's commitments are found on the New York Public Service web page. See <http://www.dps.state.ny.us/tel271.htm>.

⁴⁰ CTTG Project Report, Nov. 2, 1998, at p. 2-1.

BA, and the preparation of orders. The major portion of HP's work focused on preparing the software for the last item.⁴¹ The software, or virtual CLEC, was then used as part of the KPMG's test of BA's OSS.

OSS Testing

In its *Draft Final Report* on June 1, 1999, KPMG outlined the structure and details of the OSS testing it performed.⁴² Following a master test plan dated July 31, 1998, the evaluation was designed to test the ability of BA to provide resale and unbundled elements.

The test was arranged into four "domains."⁴³ These domains included (1) pre-ordering, ordering, and provisioning; (2) maintenance and repair; (3) billing; and (4) relationship management.⁴⁴ Within these domains, the tests attempted to simulate transactions the tester expected CLECs to present to BA, with the focus on the exchange of data. In addition, the review included monitoring of "live" transactions of CLEC activities with BA. It also included operational reviews of the procedures, structures, and documentation that BA had in place to service CLEC wholesale transactions. Thus, although the emphasis of the tests was on electronic data interchange, the test also addressed documentation and reviewed the ability of BA to scale the systems to increased demand.⁴⁵

⁴¹ Id. at 2-5 and 2-6.

⁴² KPMG, Bell Atlantic OSS Evaluation Project: Final Report (Draft) (June 1, 1999).

⁴³ Id., Part III contains a summary of the tests and their June 1, 1999 status.

⁴⁴ Id. at II-3.

⁴⁵ Id. at II-2.

One concern with the test was that transactions with the tester would be biased by BA. As a result, several procedures were adopted to validate the results. According to the final draft report:

To partially offset this lack of blindness, we instituted certain procedures to help ensure that KPMG and HP would not receive treatment from BA-NY that was obviously different from that received by a real CLEC. For example, we required that all documents given to us be generally available to all CLECs. The PSC monitored telephone calls and face-to-face meetings between KPMG/HP and BA-NY. CLECs were invited to attend conference calls. In addition, we made concurrent observations of the service quality delivered to other CLECs during the course of our test, and compared that with the quality of the service we received.⁴⁶

Another problem the tester had to address was the creation of a set of accounts. To solve this problem, BA was required to provide a test bed of accounts from across its service territory. Due to scarcity of resources in central offices, however, some accounts had to be used for multiple tests, apparently slowing the testing process.⁴⁷

Domains

As noted previously, the test was divided into four areas or domains. Each domain contained several components that were further broken down into specific measures or factors to be studied. The materials in the accompanying CD-ROM contain excerpts from Chapter III of the final report which explain the various tests. Subsequent chapters in the report provide the details of each test.

⁴⁶ Id. at II-5.

⁴⁷ Id. at II-6 and II-7.

Testing Standards

Initially, the tests were set up to determine whether BA was in compliance with OSS standards at a particular point in time. During the testing process, however, the scope of KPMG's assignment was changed. By agreement, a "test until you pass" approach was adopted. Thus, as KPMG determined that items were not in compliance with standards for OSS approval, it would issue an exception and BA would then seek to address the exception. The revised approach substantially lengthened the testing process.⁴⁸

In addition to the parity and commercial viability tests articulated by the FCC, KPMG also looked at standards drawn from Public Service Commission carrier-to-carrier requirements and its own professional judgment concerning OSS.⁴⁹

The Texas OSS Testing Approach

Background of Texas OSS Testing

In March 1998, SWB filed an application for section 271 relief in Texas. Following hearings, the Texas Public Utility Commission refused to grant the requested findings and determined that 130 open issues remained in the SWB application. A collaborative process that included the competitors, SWB, and the Texas commission staff began a detailed review that resulted in a set of recommendations for the open issues in November 1998. Based on the commitments made to the collaborative for resolution of those recommendations, the Texas commission in April 1999 conditionally agreed to support the SWB request for relief to the FCC if OSS testing were successfully completed and the company completed a three months' demonstration of actual performance.⁵⁰

⁴⁸ Id. at II-4.

⁴⁹ Id. at II-6.

⁵⁰ This material supporting this paragraph is found in the Texas web page concerning the SWB section 271 application. See <http://www.puc.state.tx.us>.

The Texas commission initially identified 29 OSS recommendations to be addressed by SWB.⁵¹ The first provided that OSS issues would be decided through a collaborative process. The others detailed the desired level of functionality, flow through, appropriate documentation and training, capacity to handle commercial volumes at standards that demonstrated parity and lack of discrimination. The Commission also required that it be assured that SWB handled manual orders at parity as well. Much of the work was left to the OSS testing encompassed in what has become Project 20000.

The Texas Master Test Plan: Overview

As a result of the collaborative efforts and with the assistance of Telcordia, the third-party contractor used by the Texas commission, the parties developed a Master Test Plan for OSS testing. The testing plan generally provides for two different activities. First, it provides for function tests of the various OSS components. Second, it provides for a capacity test of the computing systems' ability to handle normal and growing numbers of information requests and related processing. In contrast to the New York CTTG, the Texas test took place in the working environments of SWB and used the assistance of about 600 "friendly," employees of the parties who agree to participate in the test.⁵²

The Texas commission, SWB, the larger competitors including AT&T, MCI, Allegiance, NorthPoint, and Covad are participants in the testing. The test administrator, Telcordia, collected and analyzed the results of the test and assisted in the preparation of a final report to the commission. Daily reporting was required throughout the testing.⁵³ The success of the test is to be measured against agreed-to performance standards that resulted from the collaborative process.

⁵¹ See file in attached CD-ROM.

⁵² Project No. 20000 Investigation of Southwestern Bell Telephone Company's Entry into the Texas inter Local Area Transport Area Telecommunications Market, Master Test Plan at 5-16 (Apr. 1999).

⁵³ *Id.* at 17-29.

Functional Testing

The functional tests are designed to determine if certain features are available to the competitors through the SWB OSS. Several categories of business and residential service were tested: resale, UNE-Port, UNE-Loop, and Number Portability. Some error testing (i.e., the insertion of intentional errors in the individual scripts used for testing) was also included to test the ability of the system to handle problems. The administrator evaluated the results of the tests to determine if relevant performance measures are satisfied.

The large number of test scenarios, 602 at the time the document was published, resulted from the number of categories and combinations that were possible. Tests were to be run for business and residential services over each of the categories of entry and based on several order types such as retail to resale, resale to UNE-Port without and with number portability, moves, disconnections, and feature changes. There are also various scenarios for changes in directory listings.

The testing related to each of the functions. Pre-order functions being tested included address validation, customer service record checks, service and feature availability, number reservation and return, date of service availability, switching codes, dispatch, and loop qualifications.

Order processing, provisioning, billing, and maintenance and repair were reviewed as well. The order testing addressed the system's ability to receive and acknowledge orders, create service orders, reject non-complying requests, and create a firm order confirmation. Provisioning addressed service order completion and the jeopardy (requested services not provided by due date) processing. Billing addressed whether billing is accurate and the same quality as provided to SWB customers. Maintenance and repair testing assessed both planned and unplanned problems and the company's responsiveness.⁵⁴

⁵⁴ Id. at 34-46.

Capacity Testing

The capacity testing measured the ability of the SWB computer system to handle the expanded load created by the competitors. The estimate for loads was based on competitor projections for the first quarter of 2000. Based on these forecasts, testing simulated 8,000 orders and 40,960 pre-order queries a day. Because most competitors are expected to have computer systems capable of working with the SWB systems, no capacity testing of manual systems was being done. Further, the capacity tests were limited to pre-order and order capabilities.

The system must also demonstrate scalability, the ability to grow with competitors' business growth. Testing would assess whether the system can handle an additional ten percent in daily ordering. As in the functional testing, some orders had within them a basis for rejection so as to simulate normal production demands.⁵⁵

Performance Standards

Performance standards or benchmarks were agreed to as part of the testing and review process. (Additionally, the agreement contains performance penalties if SWB fails to perform at adequate levels.) In those instances where they are applicable, the test administrator used them as the basis for determining the success of the testing. For functional testing, the administrator would have to determine that the performance is in parity or meets a benchmark and the test results were stable. In the case of the capacity test, the benchmarks were relevant in a few cases, but the more common measure was whether the system handled the test load and whether the test caused a system or application failure. It is important to note, however, that not all performance measures were to be tested by these activities.⁵⁶

⁵⁵ Id. at 48-50.

⁵⁶ Id., Attachment 3.

Performance Measures

The various OSS tests are designed to determine whether the incumbent company is providing services to new competitors at parity with the services the incumbent provides itself or in a manner that will permit a competitor to initiate service in a commercially reasonable manner.⁵⁷ Inherent in that result is a determination that the operations meet certain performance standards.

Both the FCC and some state commissions have adopted proposed or actual standards to measure the performance of the incumbent. These standards, however, go well beyond the provision of pre-order, order, provisioning, billing, and maintenance functions that make up the core of the OSS activities. Also included in the various standards are provisions for system performance, collocation, directory assistance, and other items key to the introduction of new services.

Another important feature of performance standards is the adoption of statistical tests to determine if the incumbent is performing at parity. These decisions normally adopt some statistical test that measures the amount of statistical variance of the averages to determine whether the incumbent's performance is significantly different from that provided to new entrants.

A related factor is enforcement. States have tied performance measures to penalties or refunds in order to assure that incumbent does not backslide once it has received section 271 approval.

Although discussion of performance standards is beyond the scope of this report, the CD materials contain the performance standards proposed by the new entrants,⁵⁸ the

⁵⁷ See supra Part II.

⁵⁸ Local Competition Users Group, Service Quality Measurements ver. 7.0 (Aug. 28, 1998) (see file in attached CD-ROM).

FCC's Notice of Proposed Rulemaking concerning performance measurements,⁵⁹ and an order from the Michigan Public Service Commission on performance standards.⁶⁰

Viewing the CD-ROM

The accompanying CD-ROM contains most of the documents cited in this report. In addition, it also contains several related items. These additional materials are included because they are related to OSS performance in various states or regions.

To access these documents, insert the CD into your computer's CD drive. To view the documents contained on the CD-ROM, you will need to have Adobe Acrobat Reader installed on your computer. A copy of the Reader is included on the CD-ROM. To install the Reader, copy the file **reader.exe** to your computer. Once you have copied the file to your computer, the file can be installed two ways from the CD-ROM if you are using Windows 95 or 98.

Left click the Start button and select Run, use Browse to locate and select the file, and select OK to install the file.

OR

Right click the Start button and select Explore; locate the file on the CD-ROM, and double click the file to install it.

⁵⁹ In the Matter of Performance Measurements and Reporting Requirements for Operations Support Systems, Interconnection, and Operator Services and Directory Assistance, Notice of Proposed Rulemaking, CC Docket No 98-56 (Apr. 17, 1998) (see file in attached CD-ROM).

⁶⁰ In the matter of Ameritech Michigan's submission on performance measures, reporting and benchmarks, pursuant to the October 2, 1998 order in Case No. U-11654, Opinion and Order, Case No. U-11830 (Mich. Pub. Serv. Comm'n, issued May 27, 1999) (see file in attached CD-ROM).

Once you have installed the Reader, open the ReadMeFirst file. Use Run or Explore to locate the file on the CD-ROM. Double click on the file. Follow the instructions in ReadMeFirst to locate materials on the CD-ROM.

Documents on the CD-ROM

| Document Title | Description |
|---|---|
| <i>Third-Party Testing of Operational Support Systems: A Background Report and Related Materials</i> | A copy of this report |
| <i>Application of Ameritech Michigan Pursuant to section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services In Michigan, Memorandum Opinion and Order, CC Docket No. 97-137 (Released: August 19, 1997)</i> | FCC decision rejecting Ameritech Michigan's request for section 271 relief |
| <i>In the Matter of Application of BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Services in Louisiana, Memorandum Opinion and Order, CC Docket No. 98-121 (Released October 13, 1998)</i> | FCC decision rejecting BellSouth's request for section 271 relief in Louisiana |
| <i>In the Matter of Application of BellSouth Corporation, et al., Pursuant to section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services In South Carolina, Memorandum Opinion and Order, CC Docket No. 97-208 (Released: December 24, 1997)</i> | FCC decision rejecting BellSouth's request for section 271 relief in South Carolina |
| <i>In the Matter of Performance Measurements and Reporting Requirements for Operations Support Systems, Interconnection, and Operator Services and Directory Assistance, Notice of Proposed Rulemaking, CC Docket No. 98-56 and RM-9101 (Released: April 17, 1998)</i> | FCC notice of proposed rulemaking discussing performance standards and reporting |
| <i>Local Competition Users Group (LCUG), Service Quality Measurements (SQMS) (August 28, 1998)</i> | Version 7.0 of proposed standards suggested by a group of competitive local exchange carriers |

| Document Title | Description |
|---|---|
| <i>In the matter of Ameritech Michigan's submission on performance measures, reporting, and benchmarks, pursuant to the October 2, 1998 order in Case No. U-11654, Case No. U-11830 (Mich. Pub. Serv. Comm'n May 27, 1999)</i> | Order of the Michigan Public Service Commission adopting performance standards for OSS for Ameritech Michigan |
| <i>In the Matter of Petition of New York Telephone Company for Approval of Its Statement of Generally Available Terms and Conditions pursuant to section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry pursuant to section 271 of the Telecommunications Act of 1996, Pre-filing Statement of Bell Atlantic - New York, Case 97-C-0271 (filed Apr. 6, 1998)</i> | Bell Atlantic-New York pleading setting out the terms of the agreement with the New York Commission, part of which contains the basis for third-party OSS testing |
| <i>Domain Testing in KPMG Review of Bell Atlantic-New York OSS, Excerpts from KPMG, Bell Atlantic OSS Evaluation Project: Final Report (Draft, June 1, 1999)</i> | Listing of the various tests by subject area for the New York OSS test |
| <i>State of New York Department of Public Service Bell Atlantic, OSS Evaluation Project Final Report (draft dated June 1, 1999)</i> 1. Table of Contents 2. Document Control 3. Executive Summary 4. Test Summary and Analysis 5. Pre-Ordering, Ordering and Provisioning Results and Analysis (part 1) 6. Pre-Ordering, Ordering and Provisioning Results and Analysis (part 2) 7. Maintenance and Repair Results and Analysis 8. Billing Results and Analysis 9. Relationship Management and Infrastructure Results and Analysis | Draft final report of KPMG concerning the OSS test of Bell Atlantic-New York. In nine parts. Appendices are available on the New York Public Service website. See http://www.dps.state.ny.us/tel271.htm |
| <i>Master Test Plan for SWB-Texas</i> | Final test plan for Texas Public Utilities Commission test of Southwest Bell |
| <i>Texas Commission OSS Recommendations Project 16251</i> | Findings of the Texas Public Utilities Commission of necessary changes in SWB OSS and testing |
| <i>Public Utilities Commission of Texas Operational</i> | Interim report of test results for Southwestern Bell |

| Document Title | Description |
|--|--|
| <i>Support Systems Report (July 1999)</i> | of Texas |
| <i>In the Matter of Applications for Consent to the Transfer of Control of Licenses and section 214 Authorizations from Ameritech Corporation, Transferor, to SBC Communications Inc., Transferee., Proposed Conditions to FCC Order Approving SBC/Ameritech Merger, CC Docket No. 98-141 (July 1, 1999)</i> | Sets out various conditions regarding the adoption of OSS standards and performance |
| <i>California Public Utilities Commission, Telecommunications Division, Final Staff Report, Pacific Bell (U 1001 C) and Pacific Bell Communications, Notice of Intent to File section 271 Application For InterLATA Authority in California (October 5, 1998)</i> | Staff report of the California Commission that identifies concerns with the provision of OSS |
| <i>BellSouth Telecommunications Entry into InterLATA Services pursuant to section 271 of the Telecommunications Act of 1996, Staff Report and Opinion, Docket No. 6863-U (Ga. Pub. Serv. Comm'n, issued Oct. 15, 1998)</i> | Staff review of section 271 compliance and includes a discussion of OSS status |