B.   Test Results: Electronic Communications Trouble Administration (ECTA) Functional Test (M&R-2)

1.0   Description

The ECTA Functional Test evaluated the functionality of BellSouth's ECTA Gateway for Maintenance and Repair trouble report processing. The objectives of the test were to evaluate ECTA Gateway functionality and to measure ECTA Gateway response times.   This test was conducted by submitting trouble administration transactions against test bed accounts to the ECTA Gateway and analyzing ECTA Gateway responses to these transactions[1].

2.0   Methodology

This section summarizes the test methodology.

2.1   Business Process Description

See Section VII, "Maintenance & Repair Overview" for a description of BellSouth's maintenance and repair processes, the ECTA Gateway[2], and CLEC interface options.

2.2   Scenarios

The following table outlines the scenarios and functional elements used in this test. Each "X" represents a test of a function within a particular scenario. An "X + Error" denotes tests that, in addition to a valid transaction, included intentionally erroneous transactions designed to test the error handling capabilities of the ECTA Gateway.   Finally, an "X + X" denotes two valid transactions. The transactions used in this evaluation were chosen to test the applicable ECTA functions across line types specified in Table VII-2.1 below and were not intended to demonstrate statistical significance.

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[1] See Section VII, "M&R Overview" for details on the Maintenance and Repair test bed.

[2] In parallel with KCI's on-going test activities, BellSouth implemented a new release of ECTA in May 2000 that enhanced the middleware that captures data from WFA for complex trouble tickets. Re-testing activities that occurred subsequent to the release showed that it had no effect on evaluation results.

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Table VII-2.1: Test Scenarios

	Line Description	Trouble	Enter Trouble Ticket	Request Trouble Ticket Status	Add Trouble Infor-mation	Modify Trouble Admin-istration Infor-mation	Cancel Trouble Report	Verify Repair Com-pletion	Perform MLT
1	Residential ISDN BRI Unbundled Network Element (UNE) Loop[3]	Can't Call Out	X	X		X			
2	Business ISDN BRI UNE Loop	Data[4]	X + Error		X		X		
3	Business POTS Loop/Port Combo	No Dial Tone	X + Error	X		X			X + X
4	Residential POTS Loop/Port Combo	Noise	X + Error		X		X		X + X
5	Residential POTS UNE Port	Vertical Service	X	X					
6	Business SL1 UNE Loop[5]	No Dial Tone	X + Error	X	X		X		
7	Business SL2 UNE Loop[6]	Level	X	X		X		X	
8	Residential SL2 UNE Loop	Can't Be Called	X + Error		X		X		
9	Residential SL2 UNE Loop DS1[7]	Can't Be Heard	X	X	X	X		X + Error	

2.3 Test Targets & Measures

The test target was the maintenance and repair functionality for UNEs as provided via the ECTA Gateway. Sub-processes, functions, and evaluation

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[3] Integrated Services Digital Network Basic Rate Interface

[4] Problems related to data transfer such as "cannot send data" or "delay."

[5] Unbundled Voice Loop – Service Level 1 (UVL-SL1) is a non-designed circuit that can only be provided on two-wire circuits with loop start signaling. No Design Layout Record is included and there are no test access points. No remote testing for trouble reports can be performed on an SL1 loop.

[6] Unbundled Voice Loop – Service Level 2 (UVL-SL2) is a designed circuit that can be configured as a two-Wire or four-Wire facility. It includes a Design Layout Record (DLR) and a test point for remote testing when trouble is reported.

[7] Unbundled Voice Loop – Service Level 2 – Digital Signal, Level 1

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criteria, are summarized in the following table. The last column "Test Cross-Reference" indicates where the particular measures are addressed in Section 3.1 "Results & Analysis."

Table VII-2.2: Test Target Cross-Reference

Sub-Process	Function	Evaluation Criteria	Test Cross-Reference
Trouble Reports	Create trouble report	Presence of Functionality	M&R-2-1-1
		Timeliness of Response	M&R-2-2-1
	Request trouble ticket status	Presence of Functionality	M&R-2-1-2
		Timeliness of Response	M&R-2-2-2
	Add trouble information	Presence of Functionality	M&R-2-1-3
		Timeliness of Response	M&R-2-2-3
	Modify trouble report	Presence of Functionality	M&R-2-1-4
		Timeliness of Response	M&R-2-2-4
	Cancel trouble report	Presence of Functionality	M&R-2-1-5
		Timeliness of Response	M&R-2-2-5
	Verify repair completion	Presence of Functionality	M&R-2-1-6
		Timeliness of Response	M&R-2-2-6
Access to Test Capabilities	Conduct Mechanized Line Test	Presence of Functionality	M&R-2-1-7
		Timeliness of Response	M&R-2-2-7

2.4 Data Sources

The data collected for the test are summarized in the table below.

Table VII-2.3: Data Sources for ECTA Functional Test

Document	File Name	Location in Work Papers	Source
Joint Implementation Agreement for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service Version 10/07/98[8]	CLEC_JIA.doc	M&R-2-A-1	BLS

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[8] This document outlines points specific to the implementation of an ANSI T1.227-, T1.228- and T1.262-compliant CLEC interface to BellSouth's ECTA Gateway. BLS provided KCI with a generic version of this document for use in the M&R-2, M&R-3 and M&R-4 evaluations. In addition, this document was evaluated, along with JIAs actually enacted with CLECs, in M&R-9: ECTA Documentation Evaluation.

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Document	File Name	Location in Work Papers	Source
American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Extension to Generic Network Information Model for Interfaces between Operations Systems across Jurisdictional Boundaries to Support Fault Management (Trouble Administration) (ANSI T1.227-1995)	ANSI+T1[1].227-1995.pdf	M&R-2-A-2	American National Standards Institute
American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Services for Interfaces between Operations Systems across Jurisdictional Boundaries to Support Fault Management (Trouble Administration) (ANSI T1.228-1995)	ANSI+T1[1].228-1995+(R1999).pdf	M&R-2-A-3	American National Standards Institute
American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Extension to Generic Network Model for Interfaces across Jurisdictional Boundaries to Support the Service Test Function (ANSI T1.262-1998)	ANSI+T1[1].262-1998.pdf	M&R-2-A-4	American National Standards Institute
E-Mail Communication Re: ECTA Functionality	No Electronic Copy	M&R-2-A-5	BLS
Functional Test Logs	No Electronic Copy	M&R-2-A-6	KCI

2.4.1 Data Generation/Volumes

ECTA system responses were captured for M&R scenarios processed using the Test Interface to the ECTA Gateway. No volume testing was required for this evaluation.

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2.5   Evaluation Methods

The ECTA Functional Test evaluated the functional elements of the trouble reporting and screening process for both telephone number-assigned and circuit identified UNEs, as delivered to CLECs via the ECTA system. The objective of the ECTA Functional Test was to validate the existence and timeliness of ECTA trouble reporting and screening functionality for both telephone number-assigned and circuit identified UNE customers, in accordance with BellSouth's specifications and the American National Standards Institute (ANSI) T1.227, T1.228 and T1.262 standards for trouble administration.

This test cycle was executed by exercising a defined set of ECTA functions associated with trouble management activities against test bed accounts[9]. The functional elements targeted by this test included access to test capabilities, trouble report entry, query and receipt of trouble report status information, modification and addition of information to trouble reports, and cancellation/closure of trouble reports. In addition, error conditions were included to assess the ECTA Gateway's response to incorrect information. The ECTA Functional Test was conducted against BellSouth's production environment system.

The functional evaluation tested each of the ECTA functional processes against two criteria: presence of functionality and timeliness of system responses.

The following steps outline the test approach:

1. A list of test scenarios was developed to exercise the functionality of the ECTA Gateway across all available UNE line types (see Table VII-2.1). To obtain an exhaustive list of available ECTA Gateway functionality, KCI simulated the normal process followed by a CLEC in implementing an interface to the BellSouth ECTA Gateway. The normal process involves a CLEC requesting that BellSouth support certain functionality/system objects in the ECTA Gateway, and negotiations between BellSouth and the CLEC to define final functionality and object support. KCI replicated this request/negotiation process by presenting BellSouth ECTA managers and developers with a list of T1M1 compliant functions[10] and asking BellSouth to cull from that list an exhaustive set of available ECTA Gateway functions.

2. A Test Scenario Portfolio was developed for each scenario. These portfolios included:

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[9] See Section VII, "M & R Overview" for a description of the M&R test bed.

[10] The ANSI T1.228 standard lists 18 functions that can be included in a T1M1 compliant gateway. In addition, ANSI T1.262 adds the POTS line testing function (MLT) to the original 18.

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- Data Entry Files for each ECTA function within a scenario that requires data to be entered into the Test Interface[11].

- System steps to be submitted to the Test Interface.

- BellSouth Maintenance Administrator steps for functions that required responses from back-end systems.

- Expected results for each function.

Data entry was based on information obtained from the *Joint Implementation Agreement (JIA) for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service* version 10/07/98, and information provided by BellSouth Maintenance and Systems Development personnel on use of the BellSouth Test Interface.

3. Data Entry Files from Step 2 were uploaded into the BellSouth Test Interface system.

4. Using the Test Scenario Portfolios, the test scenarios were executed by:

- Using the Test Interface to access and submit Data Entry Files to the ECTA Gateway.

- Using the Test Interface to submit transactions directly to the ECTA Gateway.

- Prompting a BellSouth Maintenance Administrator to submit responses to the ECTA Gateway from a back-end system.

5. The ECTA Gateway system agent log[12] and response messages to the ECTA Test Interface were analyzed to evaluate responses and determine response times from the ECTA Gateway. System responses were documented in a test log and errors were categorized by the following underlying causes:

- ECTA functional deficiency

- User error (transactions containing user errors were corrected and resubmitted)

6. Data from Step 5 were compiled and mapped against the individual assessment criteria.

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[11] See Section VII, "M & R Overview" for details on the BellSouth ECTA Test Interface.
[12] A sample of agent log transactions was audited to validate the veracity of the information contained therein.

2.6   Analysis Methods

The ECTA Functional Test included a checklist of evaluation criteria developed by KCI during the initial phase of the BellSouth - Georgia OSS Evaluation. These evaluation criteria provided the framework of norms, standards and guidelines for the ECTA Functional Test.

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 the table below.   Definitions of evaluation criteria, possible results, and exceptions are provided in Section II.

Table VII-2.4: M&R-2 Evaluation Criteria and Results –
Presence of Functionality

Test Cross-Reference	Evaluation Criteria	Result	Comments
M&R-2-1-1	The user is able to enter a trouble report into ECTA and receive a satisfactory response.	Satisfied	ECTA was used to enter 14 trouble reports. Satisfactory responses were received for 13 of the 14 reports. One test transaction failed when attempting to create a trouble ticket for an SL1 UNE loop. KCI issued Exception 7 on this issue. BLS corrected the problem by creating a new format for entering SL1 UNE loop troubles in ECTA. KCI retesting verified that the exception has been addressed. Exception 7 is closed. See Exception 7 for additional information on this issue.
M&R-2-1-2	The user is able to request trouble report status from ECTA and receive a satisfactory response.	Satisfied	ECTA was used to check the status of six trouble tickets. Satisfactory responses were received for all six.
M&R-2-1-3	The user is able to add trouble information to an ECTA trouble report and receive a satisfactory response.	Satisfied	ECTA was used to add information to five trouble tickets. Satisfactory responses were received for all five.
M&R-2-1-4	The user is able to	Satisfied	ECTA was used to modify

Test Cross-Reference	Evaluation Criteria	Result	Comments
	modify trouble administration information on an ECTA trouble report and receive a satisfactory response.		information on four trouble tickets. Satisfactory responses were received for all four.
M&R-2-1-5	The user is able to cancel a trouble report in ECTA and receive a satisfactory response.	Satisfied	ECTA was used to cancel four trouble tickets. Satisfactory responses were received for all four.
M&R-2-1-6	The user is able to respond to trouble repair completion notifications and receive a satisfactory response.	Satisfied	When KCI first tested this function, BLS was unable to initiate this transaction because the functionality had not been properly created for the General Access Customer Advocacy Center (ACAC). KCI issued Exception 20 and BLS made modifications to their systems to correct the issue. During retesting, BLS was able to initiate three transactions, indicating that Exception 20 had been addressed. Exception 20 is closed. See Exception 20 for additional information on this issue. ECTA was used to verify repair completion on three trouble tickets. Satisfactory responses were received for two of the three. In one instance, KCI intentionally sent invalid data and the ECTA Gateway did not indicate the receipt of this invalid data. As a result of this error, KCI issued Exception 12. BLS added programing to the ECTA Gateway to correct this problem and retesting verified that the exception has been addressed. Exception 12 is closed. See Exception 12 for additional information on this issue.
M&R-2-1-7	The user is able to conduct a Mechanized Line Test and receive a satisfactory response.	Satisfied	ECTA was used to conduct four MLTs. Satisfactory results were received for all four.

Table VII-2.5: M&R-2 Evaluation Criteria and Results -- Timeliness of Response

Test Cross-Reference	Evaluation Criteria	Result	Comments
M&R-2-2-1	The user receives a timely response when entering a trouble report using ECTA[13].	Satisfied	All responses to trouble ticket creates were received within seven to 16 seconds. Responses for invalid create transactions were received within one second.
M&R-2-2-2	The user receives a timely response when requesting trouble report status using ECTA[13].	Satisfied	All responses to status requests were received within one second.
M&R-2-2-3	The user receives a timely response when adding trouble information using ECTA[13].	Satisfied	All responses when adding trouble information were received within six to 14 seconds.
M&R-2-2-4	The user receives a timely response when modifying trouble report administration information using ECTA[13].	Satisfied	All responses when modifying trouble administration information were received within six to 14 seconds.
M&R-2-2-5	The user receives timely response when canceling a trouble report using ECTA[13].	Satisfied	All responses when canceling a trouble ticket were received within six to eight seconds.
M&R-2-2-6	The user recieves a timely response when responding to a verify repair completion[13].	Satisfied	All responses when responding to a verify completion request were received within eight to 10 seconds.
M&R-2-2-7	The user receives a timely response when conducting an Mechanized Line Test	Satisfied	All responses when conducting an MLT were received within 66 to 73 seconds. The benchmark used for M&R-2-2-7

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[13] BellSouth's *Joint Implementation Agreement (JIA) for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service* Version 10/07/98 states "The end-to-end protocol target response time will be 30 seconds or less for 90% of the requests while handling 40 messages per minute. End to End [sic] maximum response time will not exceed 180 seconds." This benchmark was used for criteria M&R-2-2-1 through M&R-2-2-6. Due to the low level of ECTA usage, actual messages per minute during functional testing were well below 40.

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Test Cross-Reference	Evaluation Criteria	Result	Comments
	using ECTA.		was two to three minutes as outlined for MLT test response time in the *CLEC TAFI End-User Training and User Guide*, Issue 6.