NATIONAL EXCHANGE CARRIER ASSOCIATION, INC.

ACCESS SERVICE
TARIFF F.C.C. No. 5

TRANSMITTAL NO. 1455
JUNE 16, 2015

VOLUME 1: DESCRIPTION AND JUSTIFICATION

Defines the purpose of the filing, describes the rate structure of the access services and summarizes results.

VOLUME 1-2: TARIFF REVIEW PLAN

VOLUME 2: DEVELOPMENT OF ACCESS ELEMENT REVENUE REQUIREMENTS

Provides a projection of the companies' interstate investments, expenses, revenues and taxes for the past year cost of service study and test year.

VOLUME 3: DEVELOPMENT OF BASELINE DEMAND AND REVENUES

Provides the development of the demand quantities and revenues for the test year at current rates.

VOLUME 4: COMMON LINE RATE DEVELOPMENT

Describes and documents the procedures used to develop Common Line Rates and Federal Universal Service Charges.

VOLUME 5: TRAFFIC SENSITIVE RATE DEVELOPMENT

Describes and documents the procedures to develop recurring and non-recurring rate levels for Switched Access and Special Access services. It also describes the procedures used to develop miscellaneous charges for additional engineering, maintenance and testing of these services, as well as describing the development of Eligible Recovery, ARC rates, and CAF ICC support estimates.

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TRAFFIC SENSITIVE RATE DEVELOPMENT

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TRAFFIC SENSITIVE RATE DEVELOPMENT

Section 1

INTRODUCTION

This Volume describes the development of proposed Traffic Sensitive (TS) switched and special access rates. In the 2012 Annual Filing, NECA capped interstate switched access rates at December 29, 2011 levels in compliance with the *USF/ICC Transformation Order*. In compliance with section 51.909(a)(4), NECA proposes to increase interstate switched access rates by 1.454% in this filing to reflect the Traffic Sensitive pool composition changes effective July 1, 2015. However the rate increase does not apply to the Terminating End Office rate per FCC Order 51.909 (e) step 4, which specifies that the Target Composite Terminating End Office Access Rate is $0.005 per minute plus one-third of any difference between the 2011 Baseline Composite Terminating End Office Access Rate and $0.005 per minute.

To develop Access Recovery Charge (ARC) rates as prescribed in the *USF/ICC Transformation Order* as well as special access rates and charges, NECA used forecasted demand quantities developed in Volume 3 in conjunction with data obtained from special data requests. In the case of special access, the rates and charges recover projected test period special access revenue requirements, described in Volume 2. Given the special access projected costs as well as projected demand trends for the upcoming test period, the proposed 2015-2016 special access tariff rates increase by approximately 15.4 percent on average. Individual company rate changes are influenced by their rate band assignments which are based on the cost levels being reported

by the company to the pool. NECA proposes lower rate increases for Ethernet Transport given the strategic nature of the service.

The TS Pool for this test period is comprised of 1,021 study areas. To develop cost characteristics representative of the TS Pool and to facilitate the special access rate development process, a Rate Development Task Group (RDTG), consisting of selected TS tariff participants, was consulted. RDTG participants were asked to complete several special data requests. These companies represent approximately 8.6 percent of total TS Pool revenue (see Exhibit 1). The total TS Pool revenue includes Special Access revenue, Switched Access revenue, Access Recovery Charge revenue, and CAF ICC support revenue as prescribed in the *USF/ICC Transformation Order*.

Section 2 describes the RDTG special studies used to determine labor charges, non-recurring charges (NRC), and Access Service Order and Access Service Provisioning charges. Section 3 describes procedures used to develop proposed TS special access rates and NECA's special access rate banding. Section 4 describes procedures used to develop proposed switched access rates as prescribed in the *USF/ICC Transformation Order*.

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TRAFFIC SENSITIVE RATE DEVELOPMENT

Section 2

LABOR CHARGE, NON-RECURRING RATE, AND SPECIAL STUDIES

A. OVERVIEW

This section describes the Labor Rate, Access Service Order, and Access Service Provisioning Studies used in the development of TS non-recurring rates. Non-recurring rates recover service order processing and engineering costs associated with providing access services. As required by the *USF/ICC Transformation Order*, switched access non-recurring rates are capped as of December 29, 2011. NECA proposes to increase switched access non-recurring charges by 1.454% effective July 1, 2015, to reflect the impact of pool composition changes as described in Section 1 of this volume. Proposed special access non-recurring charges remain unchanged in this filing.

B. LABOR RATE STUDY AND LABOR CHARGE DEVELOPMENT

1. Description of Labor Charges

Additional Engineering, Additional Labor and Maintenance of Service charges are designed to recover the costs of using LEC personnel in work activities not otherwise required when providing access service to a customer.

Additional engineering is provided by the LEC at the request of the customer. Additional engineering applies when a customer requests:

(1) Additional technical information after the LEC has already provided the technical information normally included on the Design Layout Report (DLR);

(2) Customized service; or

(3) A design change to a pending order for access service.

Additional labor is provided by the LEC when a customer requests:

(1) Overtime installation;

(2) Overtime repair;

(3) Stand-by testing;

(4) Additional testing, extraordinary maintenance or repair of facilities connecting to facilities of other LECs, which is in addition to normal effort required; and

(5) Specific requests involving labor not covered in any other section of the tariff.

The Maintenance of Service charge applies when a customer reports trouble to the LEC for clearance, telephone company personnel are dispatched, and no trouble is found in the LEC's facilities. The Maintenance of Service charge also applies when the LEC dispatches personnel to the customer's premises, and the trouble is in equipment not provided by the LEC.

Additional Engineering, Additional Labor and Maintenance of Service charges are time sensitive and are billable in half-hour increments or a fraction thereof, and are designed to recover the fully assigned labor costs of the individual performing the task.

The labor rate elements further specify basic, overtime, and premium labor. Basic labor represents work performed during normal work hours. Overtime labor represents work

performed on normal work days, but outside normal work hours, and premium labor represents work performed outside of normal work days.

Additional labor, when associated with installation and repair, is chargeable only on an overtime or premium basis. Charges for stand-by testing, maintenance with other LECs, and other labor include charges for basic, overtime, and premium labor. These charges apply on a per half-hour basis.

2. Labor Rate Study and Labor Charge Development

To set labor charges reflecting the cost characteristics of NECA TS tariff participants, NECA developed its Labor Rate Study by working closely with the RDTG. The Labor Rate Study is used to develop charges for the following Labor Rate elements found in Section 13 of NECA Tariff F.C.C. No. 5:

(1) Additional Engineering

(2) Standby Testing

(3) Maintenance of Service Testing

(4) Overtime Installation and Repair

In 2009, RDTG members were asked to complete the Labor Study, which includes Labor Rates, Access Service Order and Access Service Provisioning Studies (see Appendices A, B and C). In the Labor Rates section, each company identified its labor classifications (which describe the different nature of the jobs performed by various personnel), provided loaded labor rates for each labor classification, and selected the labor classifications associated with the four labor rate elements listed above.

NECA then calculated representative labor rates by weighting each company's labor rates by its access lines in service. Exhibit 2 Workpaper 1 displays a summary of Labor Rates by classification and category.

C. ACCESS SERVICE ORDER STUDY AND SERVICE ORDER CHARGE DEVELOPMENT

1. Description of Access Service Order NRCs

a. Access Service Order NRC

The Access Service Order NRC is a one-time charge applied to a customer request for installation or moves and rearrangements of Switched Access Service, Special Access Service, and Directory Assistance (DA) Service. This charge is designed to recover the costs of specific work activities from initial receipt of an access service request (ASR) to the point at which provisioning of the circuit begins, as well as service order completion activities associated with the billing process performed after the circuit has been installed. NECA adjusted the Access Service Order NRC to reflect the relative weighting of the different services.

b. Presubscription NRC

The Presubscription NRC is designed to recover the cost of processing changes to an end user's Interexchange Carrier (IXC) selection. This charge applies only after the end user has made an initial IXC choice.

c. Design Change, Service Date Change, and Miscellaneous Service Order NRCs

The Design Change, Service Date Change, and Miscellaneous Service Order NRCs are designed to recover administrative costs associated with receipt of changes to an ASR, issuance of a service order or modification of a pending service order, and updating of company records.

These NRCs apply in addition to labor charges, if required, for Additional Engineering, Additional Labor, and Maintenance of Service. The costs associated with processing the request and billing for service performed are recovered by either the Design Change Charge NRC or the Miscellaneous Service Order NRC. An Access Service Order NRC is not applicable when a Design Change NRC, a Service Date Change NRC or a Miscellaneous Service Order NRC is applied.

2. Access Service Order Study and Service Order Charge Development

The Access Service Order Study is a time and motion study of the non-capitalized administrative work functions and their associated costs for processing an Access Service Order.[1] The study was developed by NECA, with the assistance of the RDTG. The Access Service Order Study was used to develop the Service Order NRCs for the following categories of service orders:

(1) NXX Translation

(2) Access Service (Feature Groups A, B, C, D of Switched Access, DA Trunks, Special Access, or Public Packet Data Network)

(3) Service Date Change

(4) Design Change

(5) Miscellaneous Services

Each RDTG company was asked to identify work activities required for each of the five service order categories and estimate labor costs for work activities based on a time and motion study. Total cost for each of the five categories was calculated by summing labor costs across

[1] Access Service Order data were collected in the 2009 RDTG Special Studies.

each activity involved in the service order process. Representative service order costs for each category were calculated by weighting each company's total cost for that category by its access lines in service. Exhibit 3, Workpaper 1 displays a summary of the proposed Access Service Order NRC costs and rates.

D. ACCESS SERVICE PROVISIONING STUDY AND SERVICE PROVISIONING CHARGE DEVELOPMENT

1. Access Activation/Installation NRC Descriptions

a. Switched Access Trunk Activation and Installation NRCs

The Switched Access Trunk Activation NRC is a one-time charge associated with the installation or rearrangement of switched access Feature Group A, B, C, D or DA services. This charge is designed to recover the cost of specific work activities associated with providing new, additional or modified switched access services to an access customer. Activities covered by the switched access NRC include installation and testing of trunks between the customer's serving wire center and either the tandem switch or end office for Direct Trunked Transport, and the installation and testing of trunks between the end office and the tandem switch for Tandem Switched Transport.

The Switched Access Trunk Activation NRC is applied per twenty-four (or fraction thereof) switched access lines or trunks activated for the sole use of the ordering customer and is in addition to the Access Service Order NRC.

Switched Access Installation includes designing, wiring, installing, activating, provisioning and testing facilities. The Switched Access Installation NRC is a one-time charge associated with the installation or service rearrangement of switched access services. The

switched access NRC applies on a per entrance facility (EF) basis. NECA historically set switched access installation charges for Voice Grade Two-Wire, Voice Grade Four-Wire, High Capacity DS1, High Capacity DS3, OC3 and OC12 Entrance Facilities equal to proposed special access installation charges for Voice Grade Two-Wire, Voice Grade Four-Wire, High Capacity DS1, High Capacity DS3, OC3, and OC12 Channel Termination installations because the services provided and costs incurred were identical. The proposed switched access installation charges are increased by 1.454% in this filing to reflect the impact of pool composition changes, in compliance with the requirements of section 51.909(a)(4).

b. MF Address Signaling to (from) SS7 Signaling Conversion NRC

The Multifrequency (MF) Address Signaling to (from) SS7 Signaling Conversion NRC covers the cost of the customer converting MF signaling to (from) SS7 Signaling on its trunks with Feature Group C (FG C) or Feature Group D (FG D). This charge applies only after the customer has made an initial non-chargeable optional feature choice of signaling type on its trunks. This charge is designed to recover the cost of specific work activities associated with providing modified switched access service(s) to an access customer. Activities covered by the MF Address Signaling to (from) SS7 Signaling Conversion NRC include design, installation, activation, assignment of equipment and facilities, and installation and testing of circuit/equipment.

The MF Address Signaling to (from) SS7 Signaling Conversion NRC is applied per 24 switched access trunks converted when for the sole use of the ordering customer and is in addition to the Access Service Order NRC. The rate proposed in this filing reflects a 1.454%

increase to address the impacts of pool composition changes in compliance with the requirements of section 51.909(a)(4).

c. Common Channel Signaling (CCS)/Signaling System 7 (SS7) Access Link NRC

Installation of the CCS/SS7 Access Link includes those activities involved in designing, wiring, installing, activating, testing, and provisioning of equipment and facilities used to provide the service. The CCS/SS7 Access Link NRC is a one-time charge associated with installation or service rearrangement of the CCS/SS7 Access Link. The NRC applies per Signaling Entrance Facility (SEF). The CCS/SS7 Access Link NRC was historically set equal to the proposed special access installation charge for 56.0 kbps service because the services provided and costs incurred are identical. The rate proposed in this filing reflects a 1.454% increase to address the impacts of pool composition changes in compliance with the requirements of section 51.909(a)(4).

d. Special Access Installation NRC

Special Access service installation includes designing, wiring, installing, activating, testing, and provisioning of equipment and facilities used to provide the service. Provisioning costs typically vary with the complexity of the service ordered.[2]

The special access NRC is a one-time charge associated with the installation or service rearrangement of special access services. The special access service NRC applies per channel termination (CT).

[2] Costs are different for each of the following groups of service: Voice Grade 2-wire/4-wire, Digital Data, DS1, DS3, and OC3/OC12.

2. Description of Access Service Provisioning Study

The Access Service Provisioning Study, completed by RDTG member companies, is a time and motion study of non-capitalized work functions associated with provisioning or activating Switched Access Service or Special Access Service.[3] The Access Service Provisioning Study is used to develop rates for the categories of service listed below. The switched access rates developed with this study are capped, as prescribed by the *USF/ICC Transformation Order*. As indicated above, NECA proposes to increase the switched access rates by 1.454% in this filing to reflect the impacts of pool composition changes.

(1) Local Transport - Trunk Activation (Per 24 Trunks, or fraction thereof)

(2) SS7 Signaling/Trunk Reconfiguration (Per 24 Trunks, or fraction thereof)

(3) Special Access Voice Grade Service Channel Termination

(4) Special Access Digital Data Service Channel Termination

(5) Special Access High Capacity DS1 Service Channel Termination

(6) Special Access High Capacity DS3 Service Channel Termination

(7) Special Access SONET Channel Termination

(8) Special Access Ethernet Channel Termination

(9) Digital Subscriber Line

(10) DSL Access Service Connection Function

(11) Special Access ATM Port

(12) Special Access Ethernet Port

[3] Access Service Provisioning data were collected in the 2009 RDTG Special Studies.

(13) Special Access Ethernet Virtual Connections & Extended Ethernet Virtual Connections

(14) Special Access Frame Relay FRIC or FRAC

Each RDTG company was asked to identify work activities and associated labor costs for each of the service provisioning categories above and estimate labor costs for work activities based on a time and motion study. Total cost for each of the categories was calculated by summing labor costs across each activity involved in the Service Provisioning process. Representative service provisioning cost for each category was calculated by weighting each company's total cost for that category by its access lines in service. For the channel termination element there was an additional calculation: weighted cost per channel termination was obtained by dividing weighted costs per circuit by a 'CT per Circuit' factor. Proposed Access Service Provisioning NRC costs and rates are displayed in Exhibit 3, Workpapers 2 and 3.

Access Service Provisioning costs for DSL Voice-Data and Data-Only were updated in 2010 based on inputs from the RDTG and other companies. Time required to install new/additional services or to remove/rearrange existing services was requested in the study. Total cost for each of the work activities was calculated by summing labor costs across each activity involved in the Service Provisioning process. Access Service Provisioning costs for DSL Voice-Data and Data-Only were calculated by weighting each company's costs by its DSL lines. Proposed NRC rates are displayed in Exhibit 3, Workpaper 2.

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TRAFFIC SENSITIVE RATE DEVELOPMENT

Section 3

SPECIAL ACCESS

A. OVERVIEW

This section describes how unit costs and rates for recurring and non-recurring special access rate elements were developed. For recurring non-DSL special access rate elements, proposed rates were developed for 50 rate bands. Discounts or premiums in the 50 bands are applied to an average tariff rate for a given rate element to develop the individual rate band rates. Special access rate banding is described in more detail in Section 3 N.

In the *January 2015 Rate Band Filing*, NECA expanded the number of DSL rate bands from 16 to 17 and the number of Special Access/ETS rate bands from 23 to 24. In this filing, NECA proposes to increase the number of DSL Voice-Data, DSL Data-Only, and ETS/Special Access rate bands to 50, which will better align each company's rates more closely with its costs.

Proposed rates conform to Section 69.114 of the Commission's rules, which states proposed rates for "subelements shall be designed to produce total annual revenue that is equal to the projected annual revenue requirement for the Special Access element."[4] In addition the rule states "charges for individual subelements shall be designed to reflect cost differences among subelements."[5] NECA's proposed rates for individual subelements are also set taking into consideration prevailing market rates and conditions. Based on economic theory, market-based rates produce efficient use of the current network and encourage efficient investment in plant and

[4] 47 C.F.R. § 69.114(b)
[5] 47 C.F.R. § 69.114(d)

equipment. This filing reflects an overall special access rate increase of 14.8% before billing cycle effects. The overall special access rate increase after the billing cycle adjustment[6] is 15.4%.

Section B describes NECA's special access direct cost study. Section C describes unit cost and rate development for optional features and functions. Section D describes NECA's special access unit investment study. Section E describes Frame Relay unit costs and proposed rates. Section F describes Asynchronous Transfer Mode Cell Relay Service unit costs and proposed rates. Section G describes Ethernet Transport Service unit costs and proposed rates. Section H describes Digital Subscriber Line Services unit costs and proposed rates. Section I describes Synchronous Optical Channel Service unit costs and proposed rates. Section J describes Internet Protocol Gateway (IPG) unit costs and proposed rates. Section K describes how other recurring rates are calculated. Section L describes the calculation of part-time monthly recurring rates. Section M describes crossover comparisons. Section N describes special access rate banding methodology. Section O describes how pool revenue at current rates is calculated. Finally, Section P describes the calculation of the Special Access Tariff Rate Index.

B. SPECIAL ACCESS DIRECT COST STUDY

NECA develops a direct cost factor to ensure various proposed rates cover all direct costs plus a share of overhead costs. The direct cost factor and revenue requirement are developed based on the costs underlying NECA's proposed special access service rates. Exhibit 4, Workpaper 1 details the development of the direct cost factor. The first step in developing the factor consists of classifying each Special Access cost component as direct or indirect. The

[6] The billing cycle adjustment is described in Volume 1.

interstate portion of all Special Access investments categorized under Part 36 as Central Office Equipment or Cable and Wire Facilities related (Accounts 2210 through 2441) were classified as direct. Indirect investments include general support plant (land and buildings) and plant not-in-service. Expenses related to the direct investments are assigned to the direct category (Accounts 6210 through 6441). In addition, Customer Operations expenses related to marketing and services are classified as direct (Accounts 6610 through 6620). Sub-accounts are used to assign Depreciation Expenses (Account 6560), Depreciation Reserve (Account 3100), and Deferred Federal Income Taxes (Account 4340) as either direct or indirect based on associated telephone plant. Finally, other plant-related expenses are assigned as direct or indirect in the same proportions as the related telephone plant. A portion of Return and Federal Income Taxes is also assigned to indirect to account for spare plant capacity. The direct cost factor was calculated by dividing the direct revenue requirement by the direct plant investment.

C. OPTIONAL FEATURES AND FUNCTIONS

This section describes Special Access Optional Features and Functions, their unit costs and the development of proposed rates.

Unit investments for the Optional Features and Functions are the same as in the *2014 Annual Access Tariff Filing*. NECA's Special Access Pool Direct Cost Factor from Exhibit 4, Workpaper 1 is applied to the investments to develop the direct monthly costs. The investment and direct monthly costs are displayed in Exhibit 5, Workpaper 1, along with the corresponding proposed uniform rates.

D. SPECIAL ACCESS UNIT INVESTMENT STUDY

NECA uses Electronics and Cable Cost Investment studies to develop estimates of the investment related to channel terminations, channel mileage (terminations and facility), and selected optional features and functions for High Capacity and Synchronous Optical Channel Services. These studies also develop cost estimates for SONET, TDM, ATM, and Ethernet platforms. For these studies, NECA contracts with Vantage Point Solutions, a telecommunications engineering and consulting firm with a focus on rural service providers.[7] Investment estimates are based on Vantage Point Solutions' recent network modernization projects and actual cost information from major equipment vendors. The study was most recently updated in 2008.

1. Equipment Costs

Equipment cost estimates were calculated for such items as equipment chassis, interface circuit cards, cabinets, customer premises DC power equipment, cabling, cross connect panels, equipment relay rack, fiber distribution panel, fiber optic jumpers, fuse and alarm panel, and power cabling to power board. Other costs such as building, lighting, and central office DC power plant were not included in the circuit investment calculations.

For DS1 service, copper-based technology using HDSL equipment was used to determine circuit investment from the end office to the customer premises. Fiber-based equipment was used for higher-speed services.

Equipment costs are based on market rates rather than list prices. Because the price of equipment varied by vendor and customer, Vantage Point Solutions determined equipment costs for three representative vendors and then averaged the results. Equipment costs were assigned to the Channel Termination and Channel Mileage Termination categories in the case of High

[7] More information on Vantage Point Solutions is available on their website: www.vantagepnt.com.

Capacity and SONET services. Equipment costs include an overhead factor to account for installation, engineering, and taxes. Fill factors were applied to the costs to account for equipped circuits not in use.

2. Copper and Fiber Costs

Vantage Point Solutions provided investment costs per mile for copper and fiber, based on actual upgrade projects. These projects were selected to represent the varying operating conditions of pool members. A typical copper cable was assumed to have 75 pairs, and a typical fiber cable was assumed to have 24 strands. Vantage Point Solutions developed average costs using weighting factors reflecting rural/town environments and buried/aerial construction.

After the per mile costs were developed, the next step was to calculate cable and wire facilities costs for typical circuits. To determine Channel Termination cable costs, the assumption was businesses, the primary customers for special access, are typically within 11.1 kilo feet of the central office switch. As noted above, it is assumed DS1 service is delivered to the customer location using HDSL on copper. All services at speeds above DS1 are assumed to be entirely fiber-fed.

Channel Mileage transport (to the Serving Wire Center from other wire centers or access customers) is assumed to be fiber-based (OC48).

3. Channel Termination and Channel Mileage Direct Costs

The Channel Termination rate elements recover the costs associated with the communications path between a customer designated premises and the serving wire center of that premises. Included as part of the Channel Termination is a standard channel interface

arrangement defining the technical characteristics associated with the type of facilities to which the access service is connected at the Point of Termination (POT) and the type of signaling capability, if any. The unit investment for the Channel Termination rate elements consists of a Central Office Equipment component and a Cable and Wire Facilities component. Exhibit 6 Workpaper 1 shows unit investments for the two components. Exhibit 6 Workpaper 2 converts investment levels to direct monthly costs by applying NECA's special access Direct Cost Factor (calculated in Exhibit 4, Workpaper 1) and dividing by 12. The direct monthly unit costs are summed to arrive at the total monthly unit cost for the Channel Termination rate element.

The Channel Mileage rate category recovers the costs associated with the end office equipment and the transmission facilities between the serving wire centers associated with two customer designated premises, between a serving wire center associated with a customer designated premises and a Telephone Company hub, between two Telephone Company hubs, between a serving wire center associated with a customer designated premises and a wire center equipped for Add/Drop Multiplexing (ADM) or between two ADM equipped wire centers. Channel Mileage rates are made up of the Channel Mileage Facility rate and the Channel Mileage Termination rate. The Channel Mileage Termination rate recovers the cost for end office equipment associated with terminating the facility (i.e., basic circuit equipment and terminations at serving wire centers and hubs). The Channel Mileage Facility rate recovers the per mile cost for the transmission path. Unit investments and direct monthly costs for Channel Mileage Terminations are displayed in Exhibit 6 Workpaper 3, and unit investments and direct monthly costs for Channel Mileage Facility are displayed in Exhibit 6 Workpaper 4.

For analog services, monthly unit costs of CTs, CMTs and CMFs are assumed to be equal to those in the *2014 Annual Access Tariff Filing*, and are displayed in Exhibit 6 Workpaper 5.

E. FRAME RELAY SERVICE

Frame Relay Service transmits variable-length frames of information between local area networks or customer premises equipment on an interstate frame relay network. The rate elements used for cost recovery are a Frame Relay Access Connection (FRAC), which connects an end user to a port on the telephone company's frame relay switch via a digital transport facility; a Standard Permanent Virtual Connection (PVC), which connects two customer ports or a customer port and a DSL Access Service Connection Point; and a Frame Relay Inter-network Connection (FRIC), which connects the access customer to the telephone company's frame relay switch via a digital transport facility. When customers are outside of the telephone company's serving area, they connect to the telephone company frame relay switch using a special access circuit, with the end user connecting to an End User Port and the access customer connecting to an Inter-network Customer Port. When a communications path is needed between frame relay switches in adjacent serving territories, or between a frame relay switch and a DSL Access Service Connection Point in adjacent serving territories, an Extended Permanent Virtual Connection replaces the Standard PVC. Standard and Extended PVCs are offered at a variety of Committed Information Rates. FRACs, FRICs and Ports are offered at a variety of speeds.

Unit investments are converted to annual costs by applying the direct cost factor, described in Section 3 B. Monthly costs are calculated by dividing the annual cost by 12. The use of Frame Relay is declining. Volume 5 of the *2013 Annual Access Tariff Filing* contains a more detailed explanation of Frame Relay cost development. A summary of unit investments, annual direct costs, and recurring monthly direct costs is shown in Exhibit 7, Workpaper 1.

Non-recurring costs associated with installation and rearrangements are also shown in Exhibit 7, Workpaper 1.[8]

Proposed Frame Relay Service demand, uniform recurring rates, non-recurring rates, and revenues are shown in Exhibit 7, Workpaper 2. Proposed recurring and non-recurring rates are above the corresponding direct costs of the average pool member company. A price out of Frame Relay demand at current rates is shown in Exhibit 7, Workpaper 3.

F. ASYNCHRONOUS TRANSFER MODE CELL RELAY SERVICE (ATM-CRS)

This section describes the methodology used to determine interstate costs for ATM-CRS, which is a connection-oriented service using fixed-length, 53-byte cells to transmit voice, data, and video. The rate elements used for cost recovery are Ports, Virtual Paths, and Virtual Circuit Channels (VCCs). ATM-CRS Ports verify addressing parameters contained in cell headers and transmit the cells between customer premises equipment and the ATM-CRS network. Basic Ports provide a port-only interface to the telephone company's ATM-CRS network and do not include the transport facility between the customer premises equipment and the telephone company's serving wire center. Ethernet-based Ports used in connection with ATM-CRS service, on the other hand, include the fiber optic transport facility between the customer designated premises and the telephone company's serving wire center.

An ATM-CRS Virtual Path is a predefined logical circuit with a fixed amount of bandwidth used to transmit cells between any two Ports located within the telephone company's ATM-CRS network. Virtual Paths are offered with four different traffic routing prioritization parameters, each of which has a different cost.

[8] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 694, filed Dec. 14, 1995, for calculations underlying Frame Relay non-recurring costs.

ATM-CRS VCCs are predefined logical circuits residing within Virtual Paths used to route ATM cells between any two customer designated premises served by the telephone company's ATM-CRS network. Monthly and nonrecurring charges apply only when VCCs are established by the telephone company rather than the customer. Additional monthly and non-recurring charges apply for the optional Multimedia VCC, which the customer can use to send high speed multimedia transmissions to end user customers who use ADSL Access Service.

To determine ATM-CRS direct costs, NECA worked with members of the RDTG and other Traffic Sensitive tariff participants who indicated they had plans to deploy the service, as well as ATM equipment vendors. Based on data collected from these sources, NECA built a model to determine the unit investment per megabit on a typical ATM-CRS transport network. Engineered, Furnished, and Installed (EF&I) investments were determined using a combination of vendor equipment costs and labor, along with wire center specific projections of an ATM network configuration. In 2008, NECA updated its unit investment cost models for ATM ports using data from a survey of the RDTG. All unit investments were converted to monthly direct costs by applying the Direct Cost Factor from Exhibit 4, Workpaper 1 and dividing by 12.[9]

Non-recurring charges for port installations recover one-time costs of installing and testing equipment at the Telephone Company wire center. The non-recurring charges for Virtual Paths recover the costs of setting up a logical circuit on the ATM-CRS network at the customer-specified traffic routing prioritization parameter level. The non-recurring charges for VCCs recover the costs of setting up a logical circuit to create an end-to-end communication channel between customer premises within a Virtual Path. The non-recurring charge for the optional DSL Access Service Connection Function recovers the setup costs associated with aggregating

[9] For MM-VCC, the direct cost per megabit was calculated assuming that on average, an MM-VCC carries eight megabits.

the DSL traffic to the ATM customer's port. The non-recurring charge for the optional ATM-CRS Multimedia VCC at 1 Mbps and 4 Mbps recovers the cost of setting up a logical circuit using shared transport within the telephone company network, between the ATM-CRS customer's customer designated premises and the ADSL end user customer.

Exhibit 7, Workpapers 4 through 6 display the unit investments, monthly costs, and non-recurring costs associated with ATM-CRS. Exhibit 7, Workpaper 7 displays the unit investment, monthly cost, and non-recurring cost for the ATM-CRS MM-VCC 1 Mbps and 4 Mbps options.

Using data collected in the Advanced Services Demand Data Request (included in Volume 3, Appendix B), average annual demand for Ports, Virtual Paths, traffic routing prioritization parameter levels, and Virtual Circuit Channels was calculated and priced out at the proposed rates. Demand and revenue projections at proposed uniform rates are displayed in Exhibit 7, Workpapers 8 through 10. Demand for ATM-CRS elements was allocated between the monthly plan and the term discount plan using the distribution of the SONET OC3 Channel Termination rate element based on the 2015 Advanced Services Demand Data request. The recurring and non-recurring rates are above the corresponding direct costs of the average pool member company. A price-out of ATM-CRS demand at current rates is shown in Exhibit 7, Workpapers 11 through 13.

G. ETHERNET TRANSPORT SERVICE

Ethernet Transport Service (ETS) is an interstate high speed data transport service allowing the customer to transmit voice, data and video traffic using variable length Ethernet packets.[10] The rate elements for cost recovery are Ports, used to recover costs associated with connecting to the Ethernet network and routing traffic; Channel Terminations, used to recover costs associated with the facility between the customer premises and serving wire center; and Virtual Connections and Virtual Circuit Channels, both of which are used to recover transport costs.

ETS Ports, which may be Basic Ports or Interconnection Ports, validate addressing parameters in packet headers and transmit the packets between the telephone company's ETS network and the customer designated premises. An ETS Basic Port requires an ETS Channel Termination as the transport facility between the ETS Basic Port and the customer designated premises. An ETS Interconnection Port is used to terminate a Special Access facility to the ETS network. The Special Access facility is provided separately from ETS Service.

Rates for ETS Ethernet Virtual Connections (EVCs) recover the cost of a shared transmission path for the ETS customer to transmit packets between any two ETS Ports on the telephone company's ETS network. ETS Extended Ethernet Virtual Connections (E-EVCs) rates, on the other hand, recover the cost of a shared transmission path between an ETS Port in the telephone company's ETS network and the Ethernet network of another telephone company in an adjacent serving territory. Rates for optional ETS Multimedia Virtual Circuit Channels (MM-VCCs) recover the cost of a high speed transmission path between the customer designated premises and the premises of an end user customer who uses tariffed ADSL Access Service provided by the telephone company.

[10] NECA's ETS service became effective on February 17, 2007. *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1157, filed February 2, 2007.

To develop direct costs for ETS, NECA worked with members of the RDTG who were investing in the deployment of Ethernet-based services, as well as with Ethernet equipment vendors. Based on data collected from these sources, NECA built a model to develop the unit investment per network element for deploying ETS.[11]

NECA has added several rate elements since introducing ETS service in 2007: an ETS Interconnected Ethernet Virtual Connection (ETS I-EVC) transport option for jointly provided ETS service between non-adjacent operating territories;[12] an ETS Low Bit Rate Virtual Circuit Channel (LBR-VCC) option, which provides a 64 kbps virtual circuit path (secure VLAN) between the ETS customer's Customer Designated Premises (CDP) and the premises of its end user customer, provided the end user customer's premises is equipped with a tariffed A/SDSL Access Service provided by the telephone company; [13] Class of Service (CoS) priority routing for ETS and new ETS transport speeds (2 Mbps, 5 Mbps, 250 Mbps, and 750 Mbps); [14] a new mileage tier for the ETS Interconnected Ethernet Virtual Connection (ETS I-EVC) for distances between 51and 75 miles;[15] and the Port Protection Feature for an ETS Basic Port. [16,17]

[11] NECA Transmittal No. 1157 provides additional details and descriptions related to development of ETS investment costs.
[12] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1273, filed April 30, 2010.
[13] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1291, filed October 28, 2010.
[14] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1302, filed March 8, 2011.
[15] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1327, filed December 5, 2011.
[16] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1355, filed July 27, 2012.
[17] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1380, filed April 8, 2013.

In 2014, NECA introduced three additional Ethernet Transport Service (ETS) transport speeds operating at 2.5 Gbps, 5 Gbps and 10 Gbps.[18] ETS costs for these new speeds were developed using the 2014 RDTG ETS Investment Study. Most recently, NECA introduced a new Two-Way ETS MM-VCC. [19]

Exhibit 7, Workpapers 14 through 19 display unit investments, monthly costs and non-recurring costs associated with ETS. Workpaper 14 displays the unit investments and costs for both the ETS Basic Ports and the ETS Interconnection Ports, developed from data received from RDTG surveys. NECA converted unit investment per port to a direct cost per port using the Direct Cost Factor in Exhibit 4, Workpaper 1.

Exhibit 7 Workpaper 15 displays the investment and costs for ETS Channel Terminations, developed from data received from Vantage Point Solutions and RDTG surveys.[20] Copper-based channel termination equipment includes modems at the central office and the customer premises, copper pairs, other outside plant infrastructure when applicable (poles and conduit) and other customer premises equipment associated with the provision of the telephone company's regulated service, such as cabinet and power supply. Fiber-based channel termination equipment includes SWC and customer premises' electrical-to-optical converters, fiber pairs, outside plant, and other premises equipment such as cabinet and power supply.

Exhibit 7 Workpaper 16 displays the unit investments and costs for ETS EVCs and ETS E-EVCs, developed from data received from RDTG surveys. The circuit equipment includes electrical to optical converters, transceivers, add-drop multiplexers, SONET transmission terminals,

[18] See National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1415, filed March 17, 2014.

[19] See National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1428, filed August 15, 2014.

[20] NECA updated investment costs for channel terminations up to 300 feet based on the 2015 RDTG Investment Study.

and Wave Division Multiplexers. The interoffice facilities include fiber and the facility infrastructure of telephone poles, conduits, etc. Based on RDTG input, no related costs were identified for intra-switch ETS EVCs.

Exhibit 7 Workpaper 16 also displays the transport capacity cost per Mbps for ETS I-EVCs, developed from the transport cost model based on RDTG survey input. [21] The RDTG provided three different deployment methods for ETS I-EVCs: new Ethernet facility investments, leased Ethernet facility, and Ethernet over SONET facility investments. The overall average transport capacity cost per Mbps is calculated using scenario incidence percentages as weights, which reflects the overall pool members' different deployment strategies.

Exhibit 7 Workpaper 17 is similar to Workpaper 16 for higher speeds ranging from 2.5 Gbps to 10 Gbps.

Exhibit 7 Workpaper 18 displays the average monthly unit costs for the ETS Class of Service (CoS) optional feature, developed from data received from RDTG surveys. The investment for the ETS CoS feature on intraswitch EVCs includes software and hardware for a system to test and monitor the EVC performance. The investment for the ETS feature on interswitch EVCs is incremental to the EVC investment displayed in Exhibit 7 Workpapers 16 and 17. It was developed by applying Real Time and Near Real Time factors to the EVC investment to account for the extra bandwidth reserved to support the CoS level, and then adding the testing and monitoring cost.

Exhibit 7 Workpaper 19 displays unit investments and costs per Mbps for both One-Way and Two-Way ETS MM-VCCs, developed from data received from RDTG surveys. An ETS MM-VCC is a transmission of data or video from a service provider to an end user subscribing to its service. NECA estimated the transmission capacity required to provide an ETS MM-VCC

[21] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1273, filed April 30, 2010.

based on RDTG and engineering study input. Exhibit 7 Workpaper 19 also displays the unit investment and cost for ETS LBR-VCCs.[22] The unit investment is based on the unit investment for ETS EVCs as displayed earlier in Exhibit 7 Workpapers 16 and 17. Finally, Exhibit 7 Workpaper 19 displays the unit investment and cost for the ETS Port Protection Feature for speeds up to 1 Gbps and speeds between 2.5 Gbps and 10 Gbps, for Basic Ports and associated Channel Terminations of 300 feet or less as well as associated Channel Terminations greater than 300 feet.

Exhibit 7 Workpaper 20 displays non-recurring costs associated with provisioning ETS basic ports, interconnection ports, channel terminations, EVCs, E-EVCs, the DSL access service connection point option, and the ETS MM-VCC. Non-recurring charges for ETS network element installations recover the one-time costs of installing and testing equipment at telephone company wire centers and/or between the wire centers. Non-recurring charges for ETS EVCs and ETS E-EVCs recover the one-time costs of setting up logical associations across transmission paths to transmit packets between ETS ports at the telephone company SWCs. The hourly labor rate used in the development of the ETS MM-VCC non-recurring rate is taken from Exhibit 2 Workpaper 1.

Exhibit 7, Workpapers 21 through 25 display proposed uniform recurring rates, non-recurring rates, demand, and revenues for ETS network elements. Demand for ETS elements was allocated between the monthly plan and the term discount plan using a distribution based on a study of RDTG members. Workpaper 26 summarizes test period revenue at proposed uniform rates. The proposed rates are above the corresponding unit costs of the average pool company. Workpapers 27 through 32 display ETS revenue at current rates.

[22] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1291, filed October 28, 2010.

H. DIGITAL SUBSCRIBER LINE (DSL) SERVICES

Digital Subscriber Line Access Services permit customers to access the Internet or other telecommunications services at high data transmissions speeds using local exchange transport facilities. With Asymmetric Digital Subscriber Line (ADSL) Access Service, the transmission speed from the ADSL Access Service customer premises to the network (upstream speed) is different from the speed in the opposite direction (downstream speed). With Symmetric Digital Subscriber Line (SDSL) Access Service, the upstream and downstream speeds are the same. Some of the ADSL and SDSL Access Services allow the customer to make or receive calls on a single local exchange service telephone line while simultaneously making high speed data transmissions.

As noted in Section 3A, NECA proposes to expand the number of rate bands for DSL Voice-Data Service and DSL Data-Only Service from 17 to 50. A study area may have different band assignments for Voice-Data and Data-Only services. Rate band assignments are discussed below in Section 3N.

The rate element used for cost recovery is the ADSL or SDSL Line Charge. The ADSL or SDSL Line Charge recovers the cost of the Digital Subscriber Line Access Multiplexer (DSLAM) equipment and the interoffice transport between an ADSL- or SDSL-equipped SWC and the DSL Access Service Connection Point located in the telephone company's operating territory, where the data traffic is transferred to an Internet Service Provider or other telecommunications service provider. [23] In the August 15, 2014 filing referenced in Section G, NECA introduced new speeds of 25/50 Mbps and 50/100 Mbps to the ADSL Data-Only option

[23] The October 23, 2014 filing (Transmittal No. 1434) eliminated DSL Extended Transport and associated tariff provisions.

and 10 Mbps and 100 Mbps to SDSL Voice-Data and Data-Only options. NECA also upgraded existing 5/50 Mbps ADSL customers to the new 25/50 Mbps ADSL Data-Only option and removed the 5/50 Mbps speed for the ADSL Data-Only option.

Estimates of unit costs in support of monthly line charges for NECA's DSL services are based on surveys of RDTG members and several DSL tariff participants that examined the installed cost of network equipment needed to provide DSL service. These surveys gathered information about the cost of DSLAMs, common equipment, and line cards installed in the central office or at a remote location, the cost of providing DSL service from digital loop carrier terminal (DLC) equipment typically used at remote locations, and the cost of DSL transport.

Exhibit 8, Workpapers 1 and 2 display the investments, monthly costs, and non-recurring costs developed for ADSL and SDSL services and DSL Access Service Connection Points. Total investments for ADSL and SDSL services are derived from equipment costs based on the number of equipped digital subscriber lines, and unit investments are based on the number of digital subscriber lines in service. Investments for the ADSL 1/6 Option and 3/15 Option are from the NECA 2008-2009 DSL Data Request.[24] Investments for the ADSL 25/50 and 50/100 Options and the SDSL 10 Mbps and 100 Mbps Options using FTTP are from the NECA 2008 FTTP Data Request.[25] The unit investments were converted to annual direct cost by applying the Direct Cost Factor from Exhibit 4, Workpaper 1.

DSL transport costs were based on the use of packet transport to carry traffic from DSL Connection Points to DSL end users. The transport cost is scaled by the total network capacity required to support end user traffic for the particular DSL service, then added to the annual direct

[24] NECA 2008-2009 DSL Data Request surveyed RDTG members.
[25] NECA 2008 FTTP Data Request surveyed RDTG members.

cost for equipment to arrive at the total DSL cost.[26] The cost of a copper or fiber loop, based respectively on the unit cost of a Metallic Service Channel Termination (as reported in Exhibit 6, Workpaper 5) or a Fiber to the Premises configuration (Exhibit 8, Workpaper 1, Line 12) is added to DSL Data-Only services.

The non-recurring charges for the provision of DSL service recover one-time costs of provisioning and testing the circuit equipment at the telephone company wire center. The non-recurring charges for the Special Access Connection Points recover the setup costs associated with the packet switches used to aggregate the DSL traffic.

Exhibit 8 Workpaper 2 displays the investments and costs associated with DSL Access Service Connection Points.

All of NECA's DSL services are offered under discounted and non-discounted pricing arrangements. The DSL Wholesale Pricing Plan (WPP) provides for reduced rates for DSL services under a Monthly Plan and a Term Plan. The Monthly Plan does not require any volume or term commitments. The Term Plan requires the customer to commit to a one-year or three-year term. NECA consolidated the WPP Term Plan options (formerly A and B) in the August 15, 2014 filing mentioned above.

The optional Volume Pricing Plan (VPP) is available to DSL WPP Term Plan customers. The VPP provides an additional discount on the monthly recurring per-line rate for customers who commit to monthly volume levels of in-service ADSL or SDSL lines. The monthly volume commitments and discount levels are as follows:

Monthly Volume Commitment	**Discount Level**
500 lines	5%
2,500 lines	10%

[26] The basic transport cost reflects the higher 6 Mbps downstream speed for ADSL service that became effective on April 1, 2006.

5,000 lines 15%

Demand for DSL service is collected through the Advanced Services Demand Data Request (displayed in Volume 3, Appendix C). Proposed tariff rates for DSL are being increased by 24.1%. However, after rate band movement impacts are taken into consideration, DSL rates increase, on average, by 6.5% (6.8% after the billing cycle adjustment). Proposed rates, demand, and revenues for each type of DSL service and pricing option are shown in Exhibit 8, Workpapers 3 through 6. The proposed rates are above the corresponding unit costs for the average pool member. A price out of projected DSL demand at current rates is shown in Exhibit 8, Workpapers 7 through 10.

I. SYNCHRONOUS OPTICAL CHANNEL SERVICE (SONET)

Synchronous Optical Channel Service (SOCS) provides a high speed channel for transmitting synchronous full duplex data over optical fiber using Synchronous Optical Network (SONET) transmission standards. The rate elements used for cost recovery are the Channel Termination, which recovers the cost of a dedicated high speed optical channel between the customer designated premises and the SWC; Channel Mileage Termination, which recovers the cost of equipment terminating a fiber facility between two SWCs; and Channel Mileage Facility, which recovers the cost of the high speed fiber facility between two SWCs. In addition, the optional Customer Node feature has two rate elements, the Customer Node rate element and the Customer Premises Port rate element. The Customer Node recovers the cost of terminating a high speed optical Channel Termination at the customer designated premises and converting the signal from optical to electrical format. The Customer Premises Port recovers the cost of the

channelization taking place at the Customer Node. In addition, when the customer uses optional Add/Drop Multiplexing, a Central Office Port rate element is used to recover the cost of the connection from a High Capacity or Synchronous Optical Channel Service Channel Termination to an Add/Drop Multiplexer at a wire center.

Unit investments, monthly costs, and proposed rates for Channel Terminations, Channel Mileage Terminations, and Channel Mileage Facilities are displayed in Exhibit 9, Workpaper 1 and are based on NECA's Unit Investment Study, described in Section 3 D. Unit investments for other SONET-related rate elements (such as Customer Node equipment, Central Office Add/Drop Multiplexing, and DS3/DS1 interface equipment located near the customer's premises and in the telephone company wire center) are also displayed in Exhibit 9, Workpaper 1.

SONET demand and revenues at proposed uniform rates are displayed in Exhibit 9, Workpaper 2. The proposed rates are above the corresponding direct costs for the average pool member. A price out of projected SONET demand at current rates is shown in Exhibit 10 Workpaper 4.

J. INTERNET PROTOCOL GATEWAY ACCESS SERVICE (IPG)

IPG enables IP voice networks to interconnect with the public switched telephone network (PSTN) using a telephone company-provided gateway. [27] IPG provides the customer with the ability to deliver interexchange voice traffic originated on or transported across its IP-based network for termination to the Telephone Company's local exchange service subscribers.

Recurring and nonrecurring rates for IPG ports, IPG Transport Termination, IPG Transport Mileage Facility, and IPG Transport Mileage Termination are displayed in Volume 5,

[27] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1257, filed November 13, 2009.

Exhibit 9 Workpaper 3.

K. CALCULATION OF OTHER RECURRING RATES

The following is a description of the methodology for calculating monthly recurring uniform rates for six narrowband Special Access channel/circuit types: Voice Grade, Digital Data, Metallic, Program Audio, Telegraph Grade, and Video.

1. Calculation of NECA Pool Non-Recurring Revenue. The first step is to identify the TS pool non-recurring revenue. Non-recurring rates for special access orders and special access provisioning are based on the 2009 RDTG Special Access Service Order and Special Access Service Provisioning studies. These calculations are displayed in Exhibit 9, Workpaper 4.

2. Calculation of NECA Pool Optional Features and Functions Revenue. Next, the Optional Features and Functions (OFF) proposed revenue for the TS pool is calculated by multiplying each OFF proposed uniform rate by its projected demand. The calculation of OFF revenue is displayed in Exhibit 9, Workpaper 5.

3. Calculation of High Capacity Revenue. Next, the High Capacity (DS1 and DS3) proposed revenue for the TS pool is calculated by multiplying the proposed uniform rates for the CT, CMF, and CMT rate elements by their respective projected demand. The calculation of High Capacity revenue for the monthly as well as term discount plans is displayed in Exhibit 9, Workpaper 6.

4. Calculation of Recurring Revenue Requirement. To determine the Recurring Revenue Requirement for the CT, CMT, and CMF elements for the six Special Access channel types, the total special access revenue requirement for cost and average schedule companies (Volume 2) is first increased to reflect a billing cycle adjustment.[28] Then projected revenue for the Frame Relay, ATM, Ethernet Transport Service, DSL, Non-recurring, Optional Features and Functions, High Capacity, SONET, and ICB categories is subtracted to determine the narrowband recurring revenue requirement. The results of these calculations are displayed in Exhibit 9, Workpaper 7.

5. Weighted Recurring Demand Development. The next step is to assign a rate index to each rate element normalized with respect to the Voice Grade 2-Wire Channel Termination rate. NECA uses benchmarks in assigning indices; including a benchmark ratio of 1.6:1 for comparing the Voice Grade 4-Wire Channel Termination (CT) rate to the Voice Grade 2-Wire CT rate. Each index is

[28] The billing cycle adjustment is described in Volume 1.

multiplied by its respective NECA pool projected demand to produce weighted pool demand. These calculations are displayed in Exhibit 9, Workpapers 8 to 10.

The uniform rate for a Voice Grade CT is determined by dividing the narrowband recurring revenue requirement by the sum of the monthly weighted demand for the CT, CMT, and CMF elements, divided by 12. This calculation is displayed in Exhibit 9, Workpaper 11.

The 2-Wire Voice Grade uniform rate is then multiplied by each recurring rate element's index to produce proposed rates. The sum of each proposed uniform rate multiplied by its respective demand is equal to the recurring revenue. These calculations are displayed in Exhibit 9, Workpaper 12.

L. CALCULATION OF PART-TIME MONTHLY RECURRING RATES

The daily (or part-time) uniform rates are maintained at their present relationship to the respective full-time uniform rates. Specifically, the part-time rates for program audio are maintained at 10 percent of the full-time rates. The part-time rates for video service are maintained at 55 percent of the full-time rates. Calculation of the part-time rates is displayed in Exhibit 9, Workpaper 13.

M. CROSSOVER COMPARISONS

Rates for several services serving as substitutes for each other are compared, either on a per rate element basis or circuit basis, for economic crossovers from one service to the other. Crossover comparisons are displayed in Exhibit 9, Workpaper 14.

The calculation of Traffic Sensitive Pool Special Access revenue at proposed uniform rates, including the Billing Cycle Adjustment, is shown in Exhibit 9, Workpaper 15.

N. SPECIAL ACCESS RATE BANDING

Rate banding allows companies to charge tariff rates closer to their costs and helps to retain low-cost companies in the traffic sensitive pool. Rate banding also gives companies an opportunity to move to lower bands and charge their access customers lower rates by reducing costs. DSL rate banding applies to recurring DSL rates. Non-DSL rate banding applies to most recurring, non-DSL rate elements. Every TS tariff member has a non-DSL special access rate band assignment; members also participating in NECA's DSL tariff will in addition have rate band assignments for DSL voice-data and DSL data-only service. Effective May 1, 2014, NECA introduced the structure for separate and distinct ETS rate bands.[29]

In the present filing, NECA proposes to increase the number of non-DSL rate bands from 24 to 50. This reflects NECA's long term strategy of making rate bands more granular to match unit costs.

NECA assigned member companies to special access rate bands using a combination of historical demand and revenue requirement data, changes in business conditions, projected retention ratios (revenue requirement divided by revenue), and projected contribution or receipt from the pool. The rates displayed in the Volume 5 exhibits approximate a uniform rate for the TS pool.

Exhibit 9 Workpaper 16 displays details of the 50 non-DSL special access rate bands. Exhibit 9 Workpapers 17 and 18 display the details of the 50 DSL Voice-Data rate bands and 50

[29] *See* National Exchange Carrier Association, Inc., Tariff F.C.C. No. 5, Transmittal No. 1418, filed April 16, 2014.

DSL Data-Only rate bands, respectively. A detailed listing of all the banded rates is in the Rate Comparison Report in Appendix D.

O. CALCULATION OF POOL REVENUE AT CURRENT RATES

Exhibit 10, Workpapers 1 through 6 display the calculation of revenue using currently effective uniform rates multiplied by the proposed test period demand for the NECA Traffic Sensitive pool. Workpaper 1 displays the calculation of NECA pool non-recurring revenue. Workpaper 2 displays the calculation of Optional Features and Functions revenue. Workpaper 3 displays the calculation of High Capacity revenue. Workpaper 4 displays SONET revenue at current rates. Workpaper 5 displays the calculation of IPG revenue at current rates. Workpaper 6 displays special access narrowband revenue at current rates. Workpaper 7 displays the calculation of total pool revenue at current rates and proposed rates as well as the rate change percent, including the impact of the billing cycle adjustment.

P. SPECIAL ACCESS TARIFF RATE INDEX

The Special Access Tariff Rate Index is used to ensure that special access settlements paid to Average Schedule companies are equal to their revenue requirement. The Special Access Rate Change Ratio, used in the Index,[30] is calculated in Exhibit 10, Workpaper 7 by dividing NECA TS pool Special Access revenue at proposed rates net of the billing cycle adjustment (Line 15) by NECA TS pool proposed demand at current rates (Line 13), subtracting 1, and

[30] See *2015 Modification of Average Schedules* at Section VII-F-1 (b).

applying the billing cycle adjustment factor. The ratio for the 2015 Annual Filing is 15.4%, which is the average Special Access Rate Increase.

Volume 5

TRAFFIC SENSITIVE RATE DEVELOPMENT

Section 4

SWITCHED ACCESS

A. OVERVIEW

This section describes the methodologies used to develop switched access Eligible Recovery, Access Recovery Charges (ARC), and CAF ICC support as prescribed in the *USF/ICC Transformation Order*. All revenue requirement, expected revenue, eligible recovery and CAF ICC support calculations are at the study area level. The ARC is calculated at the local exchange/rate zone level. The exhibits in Section 4 are presented at the aggregate level for the Traffic Sensitive pool companies. NECA is filing company level and exchange/rate zone level data in a TRP file, and is requesting confidential treatment of these data pursuant to the *Protective Order*.[31] As explained in the Introduction to this volume, the proposed increase in capped switched access rates (other than terminating end office) is 1.454% to reflect the impact of pool composition changes. The steps used to arrive at the rate increase are described below in Section 4B.

NECA collected data from TS pool members in its CAF ICC Support Data Collection website to develop and file company specific Eligible Recovery and the resulting Residential, Single Line Business, and Multi-Line Business ARCs at the study area, exchange, or rate zone level, as well as calculate estimated CAF ICC support at the study area level to submit to USAC

[31] *See* Procedures for Obtaining Confidential Information from 2015 Annual Access Charge Tariff Filings, Public Notice, WC Docket No. 15-75, DA 15-616 (rel. May 27, 2015) (*Protective Order*).

as required by the *USF/ICC Transformation Order* and subsequent FCC Orders. Volume 3, Appendix B contains the data collection instructions and detailed line item descriptions provided to pool participants. Section B below describes the content of the workpapers.

Exhibit 11, Workpapers 1-3 summarize the 2015-2016 interstate, intrastate, and reciprocal compensation Eligible Recovery for NECA TS pool companies adjusted for double recovery and correction of base period errors prior to revenue true-up adjustments for 2013-2014. Workpaper 4 displays all the components of the 2015-2016 pre true-up Eligible Recovery. Workpaper 5 displays the calculation of the net impact of test period 2013-2014 revenue true-up adjustments on total 2015-2016 Eligible Recovery used to develop the 2015-2016 post true-up (filing) view. Workpaper 6 displays Residential, Single Line Business, and Multi-Line Business ARC revenue and associated access lines for the 2015-2016 test period. Workpaper 7 displays the CAF ICC support calculation for the 2015-2016 test period.

B. DESCRIPTION OF THE REVENUE, REVENUE REQUIREMENT, ELIGIBLE RECOVERY, ARC, AND CAF ICC SUPPORT

1. Workpaper 1: Interstate Switched Access Eligible Recovery (Pre true-up view)

- Interstate forecasted switched access revenue requirement for the base period is the revenue requirement filed for test period July 2011 through June 2012.[32]
- Rate of Return carrier baseline adjustment factor of $(.95)^4$ is applied to interstate base period revenue requirement excluding pool administration expenses to determine the revenue requirement for the 2015-2016 test period, which is then adjusted for NECA pool administration expenses. Local

[32] For Average Schedule companies, the costs of CABS billing allocated to special access have been removed, consistent with the *June 11, 2012 Average Schedule Order*.

switching support is eliminated, and no longer netted from interstate switched access revenue requirement, except in the case of price cap affiliates.

- In compliance with the *USF/ICC Transformation Order*, interstate switched access rates are capped as of December 29, 2011. NECA proposes to increase the interstate switched access rates other than terminating end office rates by1.454% as a result of pool composition changes effective July 1, 2015 in compliance with section 51.909(a)(4). NECA followed the steps in 51.909(a)(4) to arrive at the rate increase as follows. NECA determined the net switched access contribution or receipt of the exiting and entering ILECs for the preceding calendar year, summed these amounts, and divided this sum by the sum of switched access revenues for the preceding calendar year of the ILECs participating in the traffic sensitive pool for the upcoming test period.
- NECA has shared the rate impact (adjustment factor) with each company exiting the TS pool so they can establish their new capped interstate switched access rates in their own annual filing.
- Local Switching, Local Transport, and Tandem Switched Transport rate band assignments are unchanged from the *2011 Annual Access Tariff Filing*. Please refer to Volume 5 of the *2011 Annual Access Tariff Filing* for a description of how these rate bands were assigned.
- In the *2014 Annual Access Tariff Filing*, NECA elected to implement a single interstate terminating End Office Access composite rate by combining the terminating local switching rate and terminating information surcharge

divided by 100 (the information surcharge rate is per 100 minutes).[33] Following the FCC transition of access charges in 51.909(d), the 2015 interstate target composite terminating End Office Access rate is one-third of the difference between the 2011 baseline end office rate and $0.005, plus $0.005 per minute.[34] Companies are assigned to the same rate band for End Office as they were for local switching.

- NECA developed the interstate local switching minutes forecast, as described in Volume 3. Companies were allowed to override NECA interstate forecasts with their own forecasts. The expected interstate switched access test period revenue without the terminating end office rate step-down is generated by multiplying the July 1, 2015 interstate switched access composite rate by forecasted interstate minutes.
- Each company was asked to enter forecasted interstate terminating switched access end office minutes in the CAF ICC Data Collection. The adjustment to the total projected interstate switched access revenue due to the End Office rate step-down is the difference between the projected interstate terminating end office revenue before and after the end office rate step-down. The expected interstate switched access revenue after the adjustment is the revenue used for allocation. Revenues were allocated among TS pool members in accordance with the *Designation Order*.[35]

[33] *See* 47 C.F.R. § 51.909(d)(1).
[34] Proposed originating local switching and information surcharge rates are increased by 1.454% from their current levels.
[35] *Investigation of Certain 2012 Annual Access Tariffs*, WC Docket No. 12-233, WCB Pricing No. 12-09, Order Designating Issues for Investigation, DA 12-1430 (rel. Aug. 31, 2012)

- Each company was asked to enter adjustments to the 2011-2012 interstate switched access revenue requirement based on the 2013 Cost Study to avoid double recovery as a result of re-categorizing certain equipment or other reasons.
- The pre true-up view of the adjusted interstate switched access Eligible Recovery for the 2015-2016 test period is computed in two steps. First, NECA computed the difference between interstate revenue requirement and allocated interstate switched access revenue plus the double recovery adjustments multiplied by $(.95)^4$ to carry forward the double recovery amounts entered in this and last year's Data Collection to test period 2015-2016.
- Next, the true-up for test period 2013-2014 is the 2011-2012 double recovery adjustment multiplied by $(.95)^2$ and the true-up for test period 2012-2013 is the 2011-2012 double recovery adjustment multiplied by (.95)/2 because the 2013 Cost Study, based on a calendar year, impacts only half of the 2012-2013 test period. The sum of the true-up double recovery adjustments is added to the previous step to derive the pre true-up view of the adjusted interstate switched access Eligible Recovery for the 2015-2016 test period.

2. Workpaper 2: Intrastate Terminating Switched Access Eligible Recovery (Pre True-Up View)

- The base period as defined in the *USF/ICC Transformation Order* is the fiscal year from October 1, 2010 through September 30, 2011. Intrastate terminating

switched access received revenue as of March 31, 2012 for fiscal year 2011 is the intrastate base period revenue requirement, which was collected in the 2012 CAF ICC Data Collection. Intrastate terminating switched access received revenue serves as a surrogate for intrastate revenue requirement. It includes terminating local switching, terminating tandem switched transport and total dedicated transport. Received revenue is billed revenue less uncollected revenue as of March 31, 2012 for fiscal year 2011. For companies in a state pool, the amount of "contribution to" or "receipts from" the state pool associated with terminating switched access traffic for the fiscal year 2011 is included, as well as the revenue companies received from a state fund designed to offset rates and revenues associated with intrastate access billed to interexchange carriers for fiscal year 2011. Intrastate terminating switched access revenue requirement for the 2015-2016 test period is (.95)[4] multiplied by the base period received revenue.

- Step 3 of the *USF/ICC Transformation Order* and the *March 31, 2014 Clarification Order* requires that Transitional Intrastate Access Service End Office rates shall be no higher than interstate End Office Access Service rates. In the CAF ICC Data Collection, companies were required to enter the proposed transitional intrastate rates on the intrastate TRP. If intrastate rates were lower than interstate rates as of December 2011, intrastate rates remain capped at the December 29, 2011 level. If intrastate rates were equal to interstate rates as of December 2011 and are now lower as a result of the July 1, 2015 interstate rate increase, intrastate rates must be increased to match the

new interstate rates on July 1, 2015.[36] If intrastate terminating end office rates were at parity with interstate terminating end office rates, the proposed intrastate terminating end office rates will be the same as the interstate terminating end office rates.

- In the CAF ICC Data Collection, companies selected an option for projecting the intrastate revenue for the 2015-2016 test period: Option A is the composite rate approach and Option B is the rate element approach. The composite rate is revenue based on proposed 2015-2016 rates and FY 2011 demand divided by the FY2011 terminating local switching minutes.

  With the composite rate approach, expected intrastate terminating switched access revenue is the estimated test period transitional intrastate terminating switched access composite rate multiplied by the forecasted intrastate terminating local switching minutes for the test period 2015-2016. For the rate element level approach, companies entered the forecasted demand and proposed rates at the rate element level on the intrastate TRP in the Data Collection. The expected intrastate switched access revenue is the sum of proposed rates multiplied by the forecasted demand at the rate element level.

  Test period 2015-2016 net settlement from the state pool and state terminating access support rebalancing fund revenue are also included in the test period 2015-2016 intrastate terminating switched access revenue.

[36] NECA provided its member companies a list of proposed July 1, 2015 interstate switched access rates by rate element in its CAF ICC Data Collection so that companies whose rates were at parity with interstate rates could accurately match their intrastate rates to interstate rate levels.

- Each company was asked to enter any adjustments to FY2011 received revenue due to correction of errors and adjustments to FY2011 received revenue to avoid double recovery. One company's FY2011 received intrastate revenue was adjusted to reflect the correction of errors after being reviewed with the FCC.
- The pre true-up view of the adjusted intrastate Eligible Recovery for the test period 2015-2016 is computed in two steps. First, NECA calculated the difference between intrastate terminating switched access revenue requirement and projected revenue plus the double recovery adjustment in last year's Data Collection multiplied by $(95\%)^4$.
- Next, the true-up adjustment of the double recovery amount in last year's Data Collection (adjustment in FY2011 multiplied by $.95^2$) is added to the previous step to derive the pre true-up view of the adjusted intrastate terminating switched access Eligible Recovery for the 2015-2016 test period.

3. Workpaper 3: Net Reciprocal Compensation Eligible Recovery

- Net CMRS reciprocal compensation received as of March 31, 2012 for fiscal year 2011 was collected in the 2012 Data Collection. It is the base period net CMRS reciprocal compensation revenue requirement. Net CMRS reciprocal compensation revenue requirement for the test period 2015-2016 is $(.95)^4$ of the frozen net CMRS revenue.
- Net non-CMRS reciprocal compensation received as of March 31, 2012 for fiscal year 2011 is the base period net non-CMRS reciprocal compensation

revenue requirement. It was collected in the 2012 Data Collection. Net non-CMRS reciprocal compensation revenue requirement for the test period 2015-2016 is $(.95)^4$ of the frozen net non-CMRS revenue.

- Companies provided originating and terminating non-Bill and Keep CMRS reciprocal compensation rates based on their contracts, provided they do not have a "Change in Law" provision. Companies also provided projected originating and terminating CMRS minutes.
- NECA calculated the non-CMRS reciprocal compensation rate as the lower of interstate composite rate and the effective originating/terminating non-CMRS reciprocal compensation rate. Companies provided projected originating and terminating non-CMRS minutes.
- Net reciprocal compensation is the test period estimated terminating reciprocal compensation rate multiplied by the forecasted terminating reciprocal compensation minutes, less the test period estimated originating reciprocal compensation rate multiplied by the forecasted originating reciprocal compensation minutes.
- Each company was asked to enter any adjustments to FY2011 Net CMRS and Non-CMRS reciprocal compensation received revenue in the Data Collection. The FY2011 Net CMRS and Non-CMRS reciprocal compensation received revenues were modified for one study area to reflect the correction of errors after being reviewed with the FCC.

- The pre true-up view of the net reciprocal compensation Eligible Recovery for the 2015-2016 test period is the difference between reciprocal compensation revenue requirement and projected revenue

4. Workpaper 4: Total Switched Access Pre True-Up Eligible Recovery

- This workpaper displays total pre true-up switched access Eligible Recovery. The *2012 TRP Order* (paragraphs 6 and 7) states that ILECs will be permitted to recover the portion of increases in Telecommunications Relay Service (TRS), regulatory, or North American Numbering Plan administration (NANPA) fees that would otherwise be recovered through increases in interstate switched access rates or terminating intrastate switched access rates that are now capped.[37] These exogenous costs were provided by the companies in the Data Collection. The frozen Local Switching Support (LSS) for rate of return affiliates of price cap companies is assumed for the full 2015-2016 test period. Pre True-Up Eligible Recovery is the sum of interstate, intrastate and net reciprocal compensation Eligible Recovery, and total incremental exogenous costs less frozen local switching support for price cap affiliates.

5. Workpaper 5: 2013-2014 Test Period True-Up

As required by the *USF/ICC Transformation Order*, NECA calculated the net impact of 2013-2014 test period revenue and exogenous costs true-ups and added

[37] Material to be Filed in Support of 2012 Annual Access Tariff Filings, WCB/Pricing File No. 12-08, Order, DA 12-575 (rel. Apr. 19, 2012) (*2012 TRP Order*)

it to the pre true-up Eligible Recovery to generate the post true-up Eligible Recovery for the 2015-2016 test period.

- The forecasted revenues are from the *2013-2014 Annual Filing*.[38]
- The realized revenues are from NECA's settlements database. The cutoff date for realized revenues is December 31, 2014 per the *March 31, 2014 Clarification Order*.
- The realized interstate switched access revenues are allocated among study areas using factors based on the 2013-2014 TS Pool composition. This ensures the revenues are allocated in the same fashion as the interstate forecasted revenues in the *2013-2014 Annual Filing*.
- Section 51.917 (d)(1)(v) defines the true-up revenues as (projected demand minus actual realized demand for that service) multiplied by the default transition rate for the service specified. NECA used the switched access revenue as a surrogate, per the *March 31, 2014 Clarification Order*.
- As a result of the Yale exchange acquisition by Panora from Prairie, Panora's local switching rate band increased from band 5 to band 6. NECA imputed local switching revenue using band 6 to determine the interstate and intrastate terminating switched access eligible recovery based on direction from FCC staff.
- The net impact on total 2015-2016 Eligible Recovery is the sum of interstate revenue true-ups, intrastate terminating revenue true-ups, net reciprocal compensation revenue true-ups, ARC revenue true-ups and exogenous cost

[38] *See* FCC, WC Docket No. 13-1336, (filed June. 15, 2013) (*2013 Annual Filing*).

true-ups. Positive 2013-2014 interstate, intrastate terminating, reciprocal compensation, residential ARC, SLB ARC and MLB ARC revenue true-ups are subtracted from the 2015-2016 Eligible Recovery. Negative 2013-2014 interstate, intrastate terminating, reciprocal compensation , residential ARC, SLB ARC and MLB ARC revenue true-ups are added to the 2015-2016 Eligible Recovery. Negative 2013-2014 exogenous cost true-up is subtracted from the 2015-2016 Eligible Recovery. Positive 2013-2014 exogenous cost true-up is added to the 2015-2016 Eligible Recovery.

- When the computed Eligible Recovery/CAFICC support using realized revenue is negative, the net impact of the true-up is set to zero for test period 2015-2016. When the 2013-2014 realized revenue is lower than the projected level and the 2013-2014 forecasted Eligible Recovery is negative, the true up is equal to the revenue true up less the CAFICC support using the realized revenue for 2013-2104. For example, if the 2013-2014 revenue true up is $100 but the projected eligible recovery was negative, and the CAFICC support using the realized revenue is $25, the effective true up on test period 2015-2016 Eligible Recovery is $75.
- One company that under forecasted its demand, therefore overstated Eligible Recovery for the test period 2013-2014, will refund USAC the amount that is not offset by the pre True-Up Eligible Recovery.[39]

6. Workpaper 6: Access Recovery Charge Calculations

(A) Access Recovery Charge Calculations

[39] Per the FCC's *February 24, 2015 Order*

- NECA developed residential, single line business, and multi-line business line forecasts at the study area level, which companies could override with their own forecast. Companies entered the residential line forecast at the exchange/rate zone level in the Data Collection.
- Local residential charges were collected using the higher of local rates in effect on January 1, 2012 or January 1, 2015. The exchange/rate zone level data provided by the companies were used to compute benchmark residential rates needed for developing the residential ARC. The data elements include exchange names, rate zone names, residential lines, Lifelines, and various rates. The rates include federal SLC, mandatory EAS, state SLC, state high cost and/or access replacement universal service contributions, all fixed and usage based charges for all classes of local residential service, E911 charges, and state TRS charges. The local charges at the exchange/rate zone level plus the current effective ARC rate are compared to the $30.00 rate ceiling to determine the extent to which the full residential ARC of $2.00 can be applied for test period 2015-2016. No exchange/rate zone was allowed to have an ARC rate increase of more than $.50 when compared to test period 2014-2015 rates. ARC revenue was computed as the ARC rate multiplied by the number of residential lines excluding Lifelines, multiplied by 12.
- At the company level, the single line business ARC revenue is $2.00 multiplied by the number of single line business lines, multiplied by 12.
- At the company level, the multi-line business ARC revenue is $3.00 multiplied by the number of multi-line business lines, multiplied by 12.

Companies that have reached the ceiling of $12.20 (multi-line business ARC plus federal subscriber line charge) will have a multi-line business ARC rate of $3.00 per line.

- Total ARC revenue is the sum of residential, single line business, and multi-line business line ARC revenues.
- ARC rates are set at less than the maximum allowed when the maximum rates would produce revenue that exceeds Eligible Recovery.

7. Workpaper 7: CAF ICC Calculation

- This workpaper displays CAF ICC support, which is the difference between Eligible Recovery and total ARC revenue for the 2015-2016 test period.