

## DESCRIPTION AND JUSTIFICATION

### 1.0 Introduction and Description of Filing

In this tariff filing, scheduled to become effective February 15, 2017, Somos, Inc. (hereinafter referred to as “Company”) proposes changes to Tariff F.C.C. No. 1, 800 Service Management System (SMS/800) Functions (SMS/800 Tariff) to modify rates and charges based on an updated cost study and current cost and demand data. Company proposes to include costs associated with the design and development of a new SMS/800 platform. Company also proposes to update the dates and version numbers for technical references to be available as of the filing date. The proposed modifications are detailed below.

#### 1.1 Modify Regulations and Service Offerings

- On Check Sheet change the total number of pages within the tariff from 68 to 71. Additional pages were not added to the tariff, this change reflects a correction to the quantity of pages.
- On pages 10 and 11
  - Update the titles, issue numbers and dates for certain Technical Publications. All publications are available as of the filing date for this tariff.

#### 1.2 Modify Rates and Charges

This tariff filing is also being made by Company to modify rates and charges in the SMS/800 Tariff. The proposed changes, reflecting the Company’s most current estimates of demand and cost for services provided under the tariff, would increase revenue over the prospective one-year period of February 15, 2017 through February 14, 2018 by \$5,015,729. A comparison of current and proposed rates, as well as the revenue impact of the rate changes, is displayed in Table 1 (after section 4.8).

### 2.0 Revenue Requirement Development

The prospective revenue requirement for SMS/800 from February 15, 2017 through February 14, 2018 consists of expenditures for ongoing operations of the existing system as well as expenses related to the design, architecture and development of a new SMS/800 platform. Specific budget items for the Company’s ongoing operations are:

- SMS/800 Operation and Administration which consists of: (a) Help Desk operational support to SMS/800 users including telephone assistance related to interfacing with SMS/800 and preparation/maintenance of Toll-Free Number (TFN) records, service establishment, and processing of requests for changes in Responsible Organization (Resp Org) for TFNs; and, (b) day-to-day management, planning and administrative oversight provided by Company, external operational support services such as billing, accounting, cost analysis, website support and TFN authentication, and expenses associated with the

Company's membership and Board of Directors to support management, operation and administration of the SMS/800.

The estimated revenue requirement for SMS/800 operation and administration for the one-year period of February 15, 2017 through February 14, 2018 is \$30,102,641.

- SMS/800 Data Center Operation reflects the cost of the ongoing support, maintenance of the existing production and test/disaster recovery SMS/800 data centers and operation of a Service Center (Help Desk) facility to handle security and access problems. It also includes costs associated with a technologically updated data center that will replace the existing data center. The estimated revenue requirement for the data center operation is \$21,853,393.
- SMS/800 Software Support includes the provision of software maintenance, computer site and application support, and software development for new features for the existing SMS/800 system. It also includes costs associated with the design and architecture of an updated software platform. The estimated revenue requirement for software support is \$6,550,805.

A comparison of projected past year and actual past year costs, and projected future year costs are shown in Table 2.

## 2.1 Revenue Requirement Distributions

A detailed hardware, software and activity based cost study was performed to identify average unit costs for the SMS/800 rate elements. The updated costing methodology is consistent with the methodology used for previous SMS/800 Tariff filings. The average unit costs developed are shown in Table 5. The resulting revenue requirement for each rate element is shown in Table 4. Cost-causation analyses were performed and applied to budget elements as follows:

- A Task Oriented Costing (TOC) study was used to distribute Help Desk costs to rate elements. Help Desk managers identified the primary tasks performed, how often the tasks were performed, and the average time spent performing them. Each task was then analyzed and associated with the particular rate element it supports. To the extent that Help Desk costs are not specific to a rate element, the costs are included in the CRA rate element. The resulting unit costs are shown in Table 5, column (a).
- Data center costs consist primarily of: (a) network equipment and facilities needed to provide communications access for customers' links; (b) storage hardware (tape and disk drives) for TFN record data; and (c) a processing community used to respond to and execute customer requests for SMS/800 services. *Network costs* are attributable almost entirely to rate elements required to access SMS/800. A unit cost analysis of each type of connection to SMS/800 was used to determine its cost. The processing community, consisting of central processing units and server-based distributed processors, and storage costs are related almost exclusively to the support and processing of customer records and were therefore, with only a few minor exceptions, assigned to the CRA rate element.

The Data Center also supports production of some reports and batch updates. Activity based analyses were used to capture these costs and associate them with the appropriate rate elements. The resulting average unit costs for the Data Center are shown in Table 5, column (b).

- The cost of software support includes software maintenance, site support and software development for new features. The software maintenance and site support dollars were attributed on the basis of analyses of effort by software personnel for the basic functions of software development, software maintenance and support services. The costs of the various functions were attributed to rate elements based on these analyses. The software development staff also supports production of some reports. Activity based analyses were used to capture these costs and associate them with the appropriate rate elements. The average unit costs developed for software costs are shown in Table 5, column (c).
- The Operations and Administration cost are analyzed to determine if they explicitly support any of the SMS/800 rate elements. With the exception of a small amount associated with Resp Org restoration (post suspension), the operations and administration costs are shared and common costs. The resulting average unit costs are shown in Table 5, column (d).

### **3.0 Basis of Ratemaking**

The rate structure for SMS/800 consists of service elements that are used by Resp Orgs. The proposed rate for each element is based on its projected revenue requirement and demand. The only exceptions are the proposed hourly rates for Resp Org requested MGI/WSI Additional Testing. This rate is based on changes to vendor contracts. The contractual rate of \$200 per hour is expected to remain valid for the proposed tariff period. This information is shown in Table 6.

### **4.0 Demand Forecast**

The demand forecast for the prospective tariff period is displayed in Table 3. Information and/or data considered in developing the forecast are discussed in the following sections.

#### **4.1 Customer Record Administration (CRA)**

This rate element represents the quantity of toll-free numbers for which customer records exist in the SMS/800 and is charged on a recurring (monthly) basis for each number record administered. Following the methodology used to produce prior CRA forecasts, we examined alternative statistical models (e.g., simple regression, ARIMA), searching to find the best fit of the historical data. These models predict the future value of the dependent variable (toll-free numbers) largely by analysis of past values of that variable.<sup>1</sup>

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<sup>1</sup> This is an example of the Box-Jenkins approach to time-series modeling that only uses past values of a variable to predict future values. In addition to past values, a time trend may also be considered as well as transformations of

The first issue addressed involved data frequency. The toll-free number data are collected and reported weekly, but previous tariff filings (as well as the CRA rate element charge) use monthly data. A two-year forecast of monthly data requires a 24-period forecast. Because data typically contain random elements, projections tend to become less reliable with the number of periods forecast. This problem can be mitigated by using lower data frequency, allowing random influences to offset, smoothing observed values. When high frequency forecasts are not needed, modeling the dynamics at a lower frequency is usually more accurate. For example, estimating a moving average error term with quarterly data provides an average over three months to improve the forecast, while using monthly data produces just one month's worth of moving average correction. When the individual months are not required in their own right—as is the case here—the longer observation period provides an error correction more closely related to the longer forecast needed. Of course, lower frequency data yield fewer observations over the same time frame and, all else equal, additional observations tend to improve estimation accuracy. Given that the use of annual data is ruled out due to insufficient degrees of freedom, we chose to perform our estimations with demand measured quarterly. This approach is designed to balance forecast variance against loss of observations.

The monthly forecasts for January 2017 through February 2018 reported in Table 3A represent either linear interpolations of the quarterly forecasts (2Q2017 - 2Q2018) or the result of estimated monthly CRA (1Q2017).<sup>2</sup> For the quarterly forecast, we used the unweighted average of the three months in each quarter to construct the quarterly series of toll-free numbers. The average monthly numbers for a quarter was considered to be that number which would accrue to the middle month of each quarter. The middle month for the quarter ending March 2008 is February 2008, the middle month for the quarter ending June 2008 is May 2008, etc. Use of this averaging methodology tended to smooth out random fluctuations, as desired.

Similar to the choice of quarterly data, a three year estimation window represents a tradeoff between regime stability and the number of estimation observations. Shorter time periods for estimation were considered, but there was reason to believe that these estimates were more susceptible to short term fluctuations and were less precise. Longer periods were not used because it is believed that factors that might drive demand change over time, and that factors that affected the market as recently as four years ago might not have any influence over current market conditions.

It should be noted that, unlike previous forecasts, this forecast makes use of 13 quarters of CRA. To better estimate the first quarter of the tariff period, monthly data were used to estimate the months of January through March (actual CRA data were available through December 2016). The average of these estimated months was then used to complete the 13 quarter series for the quarterly CRA tariff forecast (1Q2014 - 1Q2017). The CRA tariff quarterly forecast begins with 2Q2017.

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the variable (e.g. natural logarithms) and seasonal indicators (e.g. quarter). Indicator variables take on a value of 1 or 0 (e.g. an indicator for the first quarter of a year takes on a value of 1 for the first quarter; 0 for all other quarters).

<sup>2</sup> In the case of linear interpolations, if toll-free numbers were projected to rise from 25,000,000 to 25,300,000 from one quarter to the next, the consecutive monthly totals would be 25,100,000, 25,200,000 and 25,300,000.

In general, whenever actual data available ends mid-quarter, data for the remaining months of that quarter are unknown. This means that either some known data must be disregarded or that the remaining months in the quarter must be extrapolated. Since the former option requires disregarding actual data, the latter option is preferable. The methodology for forecasting demand for the remaining months of the quarter is similar to the methodology used for forecasting quarterly estimates (i.e., simple regression, ARIMA). The difference is that only monthly data will be used in this forecast, as opposed to smoothed quarterly data. The lack of smoothing is acceptable because the demand will only be forecasted three to four months ahead, which is a fairly short run forecast.

### *Forecasting January to March 2017 Monthly Demand*

Because the available data end in December 2016, to produce a quarterly forecast as described above, it is first necessary to produce a monthly forecast for the first quarter of 2017. The best undifferenced, mixed ARIMA model includes lagged, end-of-period TFNs, the lagged number of disconnects plus transitionals expressed as a percentage of average monthly TFN, the lagged difference between average monthly TFN and disconnects plus transitionals, indicators for the month of April and for the month of April 2013, three autoregressive terms and one moving average term and is defined by the following parameters and summary statistics:

R-Square = 0.9996

R-Square Adjusted = 0.9996

PARAMETER	ESTIMATES	STD ERROR	T-STAT
CONSTANT	1,347,822	688,413	1.9579
TFN(-3)	0.1829	0.0582	3.1416
TFN(-4)	0.3440	0.0349	9.8577
DISC_TRANS_PCT(-10)	-6,527,348	3,080,115	-2.1192
REMAINDER_TFN(-5)	0.3085	0.0585	5.2733
REMAINDER_TFN(-9)	0.1497	0.0647	2.3136
APR_IND	83,818	21,079	3.9763
APR_2013_IND	453,711	37,801	12.0026
AR(1)	1.1865	0.1596	7.4328
AR(2)	-0.2965	0.1499	-1.9789
SAR(12)	0.2228	0.0690	3.2313
MA(1)	0.2999	0.1580	1.8977

The forecast for first quarter 2017 is; January: 41,371,859; February: 41,434,020; and, March: 41,478,138. In equation form, the model indicates that:

$$\text{Forecasted Monthly CRA}_t = 1,347,822 + 0.1829*\text{TFN}_{t-3} + 0.344*\text{TFN}_{t-4} - 6,527,348*\text{DISC\_TRANS\_PCT}_{t-10} + 0.3085*\text{REMAINDER\_TFN}_{t-5} +$$

$$0.1497*\text{REMAINDER\_TFN}_{t-9} + 83,818*\text{APR\_IND} + 453,711*\text{APR\_2013\_IND} + 1.1865*\text{CRA}_{t-1} - 0.2965*\text{CRA}_{t-2} + 0.2228*\text{CRA}_{t-12} + u_t + 0.2999*u_{t-1}$$

*Forecasting Quarterly Demand Through February 2018*

The model that appeared to produce the best fit using the most recent 13 quarters of data (1Q2014 - 1Q2017) is a simple regression model which includes two lagged CRA terms, an indicator of the first quarter of 2016 and is defined by the following parameters and summary statistics:

R-Square = 0.9895  
R-Square Adjusted = 0.9859

PARAMETER	ESTIMATES	STD ERROR	T-STAT
CONSTANT	7,306,674	1,369,161	5.3366
CRA(-1)	0.5777	0.1306	4.4252
CRA(-3)	0.2533	0.1121	2.2587
Q1_2016_IND	-564,955	160,840	-3.5125

In equation form, the model indicates that:

$$\text{Forecasted Quarterly CRA}_t = 7,306,674 + 0.5777*\text{CRA}_{t-1} + 0.2533*\text{CRA}_{t-3} - 564,955*\text{Q1\_2016\_IND} + u_t$$

The linearized monthly results of this forecast are shown in Table 3A.

**4.2 Change of Resp Org for Toll-Free Number**

This element provides for changing the Resp Org for a TFN and is charged on a non-recurring (per request) basis. Demand during the prior tariff period is expected to be approximately 5,735 significantly below the anticipated demand in part due to the implementation of the Centralized Resp Org Change system. Projected demand is anticipated to decline to 5,400 for the prospective one-year period of February 15, 2017 through February 14, 2018.

**4.3 SMS/800 Access**

This service element provides for the connection of dedicated and non-dedicated communications links to the SMS/800 and is charged on a recurring (monthly) basis. Monthly demand for non-dedicated access is anticipated to decrease slightly relative to 2016 levels resulting in a demand of 9,780 for the upcoming tariff period. Demand for dedicated MGI access increased during 2016 and is expected to level off with annualized demand of 720. Monthly demand for non-MGI dedicated access has increased during 2016 and is projected to remain at those levels resulting in demand of 2,376 for the prospective one-year period of February 15, 2017 through February 14, 2018.

#### **4.4 Service Establishment**

This service element provides for various aspects of establishing service, i.e., first logon ID, subsequent (additional) logon IDs and Security Keys as well as the restoration of services for Resp Orgs that have had service suspended. Charges for these services are applied on a non-recurring (one time) basis. Demand for first logon IDs during the prior tariff period is 22 and demand is expected to be slightly higher for the upcoming tariff period at 24. Average monthly demand for subsequent logon IDs was nearly 30, lower than anticipated. Demand is expected to rise resulting in annualized demand projection of 422 for the prospective tariff period. The issuance of Security Keys are projected to increase from the prior tariff period total of 84 to 156 for the prospective tariff period of February 15, 2017 through February 14, 2018. The demand for Resp Org restoration of service (post suspension) has been reduced in part due to changes in process and thus is anticipated to remain near current levels with annual demand of 6 for the prospective tariff period.

#### **4.5 Customer Reports**

This service element provides for the preparation and delivery of customer specific off-line reports as well as the preparation and delivery of standard recurring on-line reports. The on-line report demand for the prospective tariff period February 15, 2017 through February 14, 2018 is 117. The on-line report is charged “per report.” Off-line reports are charged “per hour” to prepare and deliver for each customer request. Approximately 7 hours of effort were requested during prior tariff period and the anticipated total hours during the prospective tariff period of February 15, 2017 through February 14, 2018 is 13.

#### **4.6 MGI/WSI Additional Testing per Hour**

This service element provides for initial and/or additional testing as requested from the SMS/800 software support team and is charged on an hourly basis as required. The anticipated MGI testing related to new customers will result in some testing activity currently expected to be 37 hours during the prospective tariff period February 15, 2017 through February 14, 2018.

#### **4.7 Batch Updates**

This service element allows customers to request changes and updates for multiple Toll-Free records and is charged per file processed. Monthly demand has decreased during recent years as Resp Orgs have other methods for performing these tasks. Demand for the prospective tariff period February 15, 2017 through February 14, 2018 is projected to be 154 batch updates.

#### **4.8 Batch Update Testing per Hour**

This service element provides for initial testing of batch update files and formats required to properly conduct batch updates on the SMS/800 system as requested from the SMS/800 support team and is charged on an hourly basis as required. No additional Resp Orgs are anticipated to be adding this functionality and thus there is no activity expected for the prospective tariff period February 15, 2017 through February 14, 2018.