Review of Cost Allocations

For

Click! Network
Tacoma Power
Tacoma, Washington

Virchow, Krause & Company, LLP
Ten Terrace Court
P.O. Box 7398
Madison, WI 53707-7398

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Foreword

Tacoma Power contracted Virchow, Krause & Company, LLP to assess the reasonableness of its method of allocating the capital investment and operating expenses of Click! Network between power and commercial applications. Power applications are uses of the Click! Network infrastructure that support electric transmission and distribution operations. Commercial applications are cable TV, Internet, and data transport services sold to wholesale and retail customers. This report provides background information, our opinion of the allocation method, and the basis for that opinion.

The scope of this project is limited to a review of the reasonableness of the allocation method. The scope does not include an audit or an opinion of Click! Network's accounts and records or of the projected benefits of automation.

1. Summary

Based upon our review, the method used by Click! Network (Click!) to allocate costs between power and commercial operations appears to be reasonable given the unique characteristics of Tacoma Power.

1.1 Overview of Allocation Method

Click! Network takes an incremental cost approach to allocate both capital dollars and expenses. Power applications are identified as the primary motivation and use of the telecommunications infrastructure. Investments and activities that are made necessary by the existence of cable TV, Internet, or broadband services are allocated to commercial operations.

1.2 Reasonableness Test

To test the reasonableness of the cost allocation done by Click!, we calculated the allocations with an alternative approach. This approach uses the present value of the projected customer automation benefits. With the present value approach it is appropriate to allocate 100% of the fiber portion of the network to the power applications. The coaxial portion, however, needs to be divided between the commercial and power applications.

To determine how to divide the costs, we calculated the present value of the projected customer automation benefits. The present value of the projected benefits is then allocated to the power application and the difference between the total coaxial network cost and the present value of the benefits is then applied to the commercial applications. This approach yields a 28/72 allocation between the commercial and power applications. Given this result, we feel the 27/73 cost allocation used by Click! is reasonable.

1.3 Operational Expenses

We also concur with Click! Network's expense allocation. This opinion is based upon past experience and is supported by the present value approach described above. We have provided financial and business advisory services for over 50 municipalities that are considering offering voice, video, and data services.

2. Cost Allocation Methods

2.1 Allocation of Capital Investment

To allocate total capital investment and estimate depreciation for the two business categories, Click! staff evaluated each of the original 32 Telecommunications Project work orders to determine their commercial and power related portions. The team asked itself:

> "Would these investments have been made if Tacoma Power was not offering Cable TV, Internet, or other commercial broadband services?"

If the answer was no, the investment costs were allocated to Commercial Applications.

The work orders used to develop the breakdown are shown on Table 2.1. The Commercial Applications investment was found to account for $23.5 million of the total project investment of $85.8 million as of September 2000. To allocate depreciation between business lines, the Finance Department multiplied the total depreciation by the ratio of business line investment to total investment – 27.4 percent for commercial services and 72.6 percent for power applications.

A few of the original work orders were still open when the allocation ratios were developed. All are now closed, with a final total of $90.6 million. Click! continued to use the 27.4 percent and 72.6 percent ratios for these work orders.

Starting with the 2001/2002 Biennium, however, all new work orders have been designated as either Commercial or Power, so that investments can be tracked separately. Open work orders (as of February of 2003) total $14 million, of which $9.5 million are for commercial applications and $4.7 million are power related.

2.1 Allocation of Capital Investment (cont.)

Table 2.1: Cost Allocation Summary

Description	WO NBR	LTD Total Capital Spending	Commercial Applications	Allocation to Commercial
SE Hub Construction - Hub 1	**17000**	**$ 18,017,341**	**$ 180,173**	**1.00%**
NW Hub Construction - Hub 3	**17001**	**9,539,585**	**95,396**	**1.00%**
Headend Construction	17002	4,196,540	3,432,128	81.78%
HFC Network Design	**17003**	**1,241,467**	**12,415**	**1.00%**
SONET Network	17004	3,703,911	3,703,911	100.00%
Telecom Make Ready	17005	8,179,229	-	0.00%
Telecom Tools & Equipment	17006	873,398	148,717	17.03%
Set Top Recievers / 2000	17007	6,475,591	6,475,591	100.00%
Telecommunications Vehicles	17008	2,177,211	250,000	11.48%
Materials & Supplies	17009	180,908	180,908	100.00%
Marketing	17010	-	-	
Additions & Betterments	17011	1,186	-	0.00%
Business Overhead Costs	17012	234,112	163,900	70.01%
Administrative Costs	17013	1,549,743	416,416	26.87%
NE Hub Construction - Hub 2	**17014**	**9,211,239**	**92,112**	**1.00%**
SW Hub Costruction - Hub 4	**17015**	**3,635,515**	**36,355**	**1.00%**
Worldgate	17017	645,252	645,252	100.00%
Internet Access	17018	900,443	-	0.00%
Multi-Dwelling Units	17019	4,603,399	3,682,719	80.00%
Commercial Installations	17020	3,057,623	3,057,623	100.00%
1999 Equipment	17021	53,783		0.00%
Purchase - J Mux Equipment	17022	814,670		0.00%
Vehicles 1999/2000	17023	446,211		0.00%
Monitoring Equipment	17024	176,994		0.00%
Headhend 1999	17025	78,578		0.00%
Administrative Fees & Costs	17026	96,845	75,670	78.14%
Capitalized Drops	17027	1,516,132	827,808	54.60%
Headend 2000	17028	86,218		0.00%
NW Hub-1 Construction - A&B	**17029**	**263,964**	**2,640**	**1.00%**
SE Hub-3 Construction - A&B	**17030**	**646,900**	**6,469**	**1.00%**
NE Hub-2 Construction - A&B	**17031**	**1,341,025**	**13,410**	**1.00%**
SW Hub-4 Construction - A&B	**17032**	**1,879,122**	**18,791**	**1.00%**
Total		$ 85,824,135	$ 23,518,404	
Total Hub Construction & Design (see bold items)		$ 44,534,691	$ 445,346	
		Commercial Allocation	**27.40%**	
		Power Allocation	**72.60%**	

2.2 Allocations of Operating Expenses

Prior to the 2001/2002 Biennium, most of Click!'s labor hours were coded under one Organizational Unit – 5511, and one task number – 820.1. This practice, which began when Click! was initially formed, made it hard to separate operating expenses between power and commercial activities. It also made it difficult to hold managers and supervisors accountable for their performance. With these problems in mind, the Section Manager reorganized Click! in the fall of 2000 into Organization Units (Orgs) – each with distinct and easily identifiable roles in daily operations. Along with work delivery and quality control, front-line managers and supervisors were given responsibility for budgeting and cost control within their "Org."

2.2 Allocations of Operating Expenses (cont.)

Org and Org Name		Description
5511	General Manager	- Overall administration of the section
5521	Marketing and Business Operations	- Administration of 5520 series Orgs
5522	Sales and Marketing	- Marketing of commercial services
5523	Video Services	- Non-labor org; includes video revenues and programming costs
5524	ISP Advantage	- Non-labor org; includes Internet costs
5525	Customer Care	- Customer care department
5526	Business Systems	- Billing and operations reports
5527	Broadband Services	- Engineering and maintenance of equipment and circuits sold to large business customers
5532	Technical Operations	- Administration of 5535, 5536, 5537 Orgs
5535	Service Installations	- Service technicians installing cable drops; and wiring homes and small businesses for CATV and Internet
5536	Network Operations Center	- 24 X 7 monitoring of SONET and HFC networks; dispatch functions
5537	Inventory Control	- Provisioning and control of set-top receivers
5533	Network Operations	- HFC network operations and maintenance
5534	Network Applications	- Engineering and maintenance of digital fiber network
5541	Field Operations	- Non labor org; administration of 5542, 5546
5542	Engineering Services	- HFC network design; management of cable installations in multiple dwelling complexes
5546	Construction	- Network construction; underground drops

To divide operating expenses, each Org was analyzed and costs assigned using the same logic applied to capital investment. Orgs 5521 through 5527, and 5537, are assigned 100 percent to Commercial operations. Orgs 5533, 5534, and 5536 are assigned 100 percent to Power; and Orgs 5511, 5532, and 5535 are split 50/50. Most labor hours and materials associated with the Field Operations Orgs are assigned to specific capital work orders. Items that are expensed are assigned to Power.

3. Network Overview

The original construction consisted of 770 miles of plant, of which 140 miles are fiber and 630 miles are coaxial cable. The network is a Hybrid Fiber Coaxial (HFC) design and each fiber node (total of 88) passes an average of 1,000 homes. The network:

- Links 30 of Tacoma Power's 65 substations (plans are in place to expand this to the majority of Tacoma Power's substations. Substations not supported by fiber will have a microwave connection).
- Provides cable television service to over 22,000 customers (approximately 76,000 homes passed, of which 66,000 customers represent Click! Network's cable TV market)[1].
- Passes approximately 49% of customers served by Tacoma Power (assumes 154,000 total customers).
- Supplies cable Internet services (on an open access basis) to 7,000 end users.
- Provides fiber based high-speed data transport to area businesses.

Future plans call for expanding the network's reach to more substations and expanding the use of customer automation for residential and commercial customers.

The authorization to build the telecommunication network was given in April of 1997. The stated purpose was to enhance electric service reliability, reduce operating costs, and diversify the utilities' revenue base.

[1] The difference is due to Multiple Dwelling Units with exclusive contracts with the incumbent cable provider and with master antenna satellite systems.

4. Review of Allocation Method

The allocation method used by Click! was based upon the question:

> "Would these investments have been made if Tacoma Power was not offering Cable Television, Internet, or other commercial broadband services?"

If the answer was no, the investment costs were allocated to commercial operations.

In review, the allocated costs (see Table 2.1), with the exception of the Hub construction and Network Design Costs,[2] [3] each appear to have a clear distinction between the power and commercial applications. In addition, the Hub construction and Network design cost allocation has a high impact on the end conclusion. For example:

- A 1% allocation to the commercial application results in 27.40% of costs to commercial and 72.60% to power.
- A 99% allocation to the commercial application results in 79.67% of costs to commercial, and 20.33% to power.
- A 50% allocation to the commercial application results in 53.54% of costs to commercial and 46.46% to power.

Given this sensitivity and the clear distinction with the other costs, our reasonableness test focused on the Hub construction and Network Design cost allocation.

To initiate our reasonableness test, we asked some additional questions.

1. Has the electric utility pursued use of the HFC network?
2. What alternative network options were available in 1997?
3. Is the cost allocation percentage the same between the fiber portion of the network and the coaxial segments?
4. What network costs (for power applications) are reasonable, given the projected benefits to power operations?

The first step in answering the above questions is to review how Tacoma Power has leveraged the availability of the HFC network.

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[2] Work orders: 17000, 17001, 17003, 17014, 17015, 17029, 17030, 17031, and 17032. These work orders represent 53% of the total costs ($45,776,158).

[3] The Make-Ready costs (work order #17005) are also substantial ($8,179,229) and are often charged to the organization that is requesting an attachment. The electric utility does however; obtain a substantial benefit since the lifetime of the utility plant is extended.

4.1 Use of the HFC Network by Tacoma Power

Tacoma Power has active customer premises and facility management applications that are based upon the availability of the HFC network. Current and planned applications include:

- SCADA and Distribution Automation Support
  + Uses the fiber portion of Network
  + Is a mature application
  + Click! supports SCADA at 32 locations (and more to follow, see Section 3)

- Residential Gateway Project
  + Leverages availability of the HFC network
  + In process of implementing a 10,000 home trial
  + Supports Automated Meter Reading (AMR), time-of-use rates, outage detection, service connect/disconnect, and prepaid metering programs

- Commercial/Industrial Customer Automatic Meter Project
  + Eliminates need for a telephone (landline or cellular) for communications with meters
  + Customer trial at 250 locations
  + Supports AMR, Time-of-Use (TOU) rates, outage detection, and other customer automation activities

Tacoma Power, although it is not using the full capabilities of the HFC network, has shown a strong intent to continue and expand its use.

4.2 Responses to Questions

1. Has the electric utility pursued the use of the HFC Network?

   Yes, as indicated above, Tacoma Power is using and plans to expand the use of the HFC Network.

2. What alternative network options were available in 1997?

   In 1997, a variety of vendors claimed to have a solution. In reality, most were in the early development stage, not proven in a wide scale deployment or on the verge of bankruptcy. The vendor community proposed a variety of media including:

   - PLC
   - Radio
   - Telephone
   - Fiber/Coax
   - Leased

   Given the desire for electric service connect/disconnect reliance on the telephone or other leased circuits is ill-advised. In addition:

   - The radio systems were not proven (many of the vendors promoting two-way applications have disappeared or have abandoned their plans).

   - The PLC vendors were primarily one-way which supported AMR. Two-way applications, although showing promise in 1997, had consistency issues to overcome.

4.2 **Responses to Questions** (cont.)

- The HFC plant was proven for reliable two-way communication, but vendor hardware for the customer premises was limited.

Given the above, assuming Tacoma Power could justify the network expense (i.e., sufficient benefits existed), pursuit of an HFC network was reasonable.

3. Is the cost allocation percentage the same between the fiber portion of the network and the coaxial segments?

   Clearly, the majority of the cost of the fiber network can be allocated to power applications. This allocation is based upon the need for communication at the substation to support SCADA and Distribution Automation. In fact, many electric utilities have implemented fiber to their substations and key field device sites.

   The allocation of the coaxial network can be based on the net present value of residential and commercial customer automation (see question 4).

4. What network costs are reasonable, given the projected benefits to power operations?

   Click! has estimated the annual benefit for residential and commercial automation is approximately $11.5 million. Given that the HFC network passes 49% of customers, the gross-benefit applicable to the existing coax portion of the network is $5.6 million.

These benefits are driven by Tacoma Power's unique characteristics. For example, Tacoma Power:

- Sees an annual customer churn of 30,000 (20 percent of customers).
- Receives a high volume of customer calls per day.
- Has a large number of its customers at or below poverty level (increases benefit of pay-as-you-go programs).

As a result, the benefits of customer automation may be greater for Tacoma Power than for the typical municipal utility.

5. Reasonableness Test – Network Cost Allocation

To determine the allocation based upon benefits, we need to answer three more questions.

1. What was the percentage of coaxial costs for hub construction and design?
2. What additional customer premises implementation costs (beyond the HFC network) are required to realize the customer automation benefits?
3. What is the present value of the customers' automation benefits attributable to the coaxial portion of the HFC network?

The answers to these questions follow:

5.1 Allocation Based Upon Benefits

1. What was the percentage of coaxial costs?

   Assuming the per mile construction for fiber and coaxial cable (with active elements) is similar[4], the coaxial network segment cost is estimated by:

   $$\text{Coaxial Network Cost Estimate} = \frac{\$45{,}776{,}158^{5} \times 630 \text{ miles of coax}}{770 \text{ miles of cable}}$$

   $$\text{Coaxial Network Cost Estimate} = \$37{,}536{,}450$$

   The average cost per homes passed for the coaxial portion of the network is $494 ($37,536,450 divided by 76,000).

2. What additional customer premium implementation costs (beyond the HFC network) are required to realize the customer automation benefits?

   From Click! August 2002 Business Plan, it is indicated that the approximate customer premises cost will be $202 to $313 per meter location (mid-point of $258).

3. What is the present value of the customer automation benefits attributable to the coaxial portion of the HFC network?

   As indicated in Section 4, question 4, an annual benefit of $5.6 million. If we assume that 15% of these annual benefits are applied to a funded depreciation account, the remaining benefit is $4,824,026 per year.

[4] Based upon our experience with other implementations, this assumption is supportable.
[5] See total Hub construction and design costs from Table 2.1.

5.1 Allocation Based Upon Benefits (cont.)

This net benefit of $4,824,026 then can be allocated between the average coax cost per customer and the mid-point of the customer's premises costs. This results in:

$$\text{Annual net benefit applied to coaxial portion of network} = \$\ 4{,}824{,}026 \times \frac{494}{(494 + 258)}$$

$$\text{Annual net benefit applied to the coaxial portion of the Network} = \$\ 3{,}168{,}975$$

Assuming a 20-year lifetime and a 6% discount rate, the resulting present value of the annual net benefit is $36,347,894.

5.2 Allocation Calculation

Given the above present value of the customer automation benefits attributable to the coaxial portion of the network, the resulting allocation between the commercial and power application is made:

Power Application Allocation		$ 8,239,708	Fiber portion of Network (100%)
	plus	36,347,894	Net present value of customer automation benefits attributable to coax portion
		$ 44,587,602	Power Application Allocation
Commercial Application Allocation		$ 45,776,158	Total Hub construction and design
	less	44,587,602	Power Application Allocation
		$ 1,188,556	Commerce Application Allocation

The results yield an allocation of 2.6 percent of the Hub construction and design to commercial applications. This is an increase over the 1% indicated in Table 2.1. This results in increasing the total allocation to commercial applications by $732,418 to $24,250,822.The resulting overall allocation is:

- 28% to commercial applications
- 72% to power applications

Assuming that Tacoma Power pursues full customer automation and that the projected benefits are realized, this method supports the allocation method developed by Click! Network.

6. Operation Expenses – Reasonableness

In Section 2.2, the list of Organizational Units (Orgs) and the allocations were presented. From review of the "orgs", and our general experience gained from review of other systems, we concur with the allocations between the power and commercial applications for:

Orgs 5521 through 5527	100% to commercial
Org 5537	100% to commercial
Org 5534	100% to power
Org 5532	50/50
Org 5535	50/50

For Org 5511, General Manager, based upon experience with other systems, the 50/50 allocation appears to be heavy towards the power application. Our experience base, however, is largely with smaller organizations that are in the cable television business. With the smaller systems, the general manager tends to have a high degree of customer contact and the attention required to be paid to the cable television business is substantial. Given the size of Tacoma Power, the 50/50 allocation may be appropriate.

We also concur with the assignment of the HFC Network operation and maintenance to the power applications. The calculation made in section 5 supports the allocation of the operation and maintenance expenses to the power applications.

7. References

"2002 Business Plan," Click! Network – Tacoma Power, August 2002.

"2002 Financial Report," Tacoma Power, December 31, 2002.

"Benefits from Residential and Commercial Implementation of the Electronic Initiatives," Gateway Project, July 3, 2002.

"Commercial Capital Costs," October 9, 2000.

"Information Requested on Click! Business Plan," memo from S. Klein & D. Toulson, August 12, 2002.

"Tacoma Power Substations and RTU Installations," May 19, 2003.