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KEEPING THE LIGHTS ON

Maximizing Power Cost Equalization
Tips for Non-Regulated Utilities in Rural Alaska

ABSTRACT

This handbook is intended to help interns, new and experienced electric utility clerks and managers produce reports that meet the requirements of the Power Cost Equalization program and maximize the PCE subsidy for the benefit of their customers.

Kokhanok Village Council

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Introduction

Alaska's urban road-connected communities have benefited greatly from major state-subsidized energy projects such as the hydropower plants at Four Dam Pool and Bradley Lake and the Alaska Intertie connecting customers from Fairbanks to Homer. Rural legislators agreed to support this large funding package for urban Alaska in exchange for a program to help spread benefits to remote communities.

The Power Cost Assistance fund was started in 1985. PCA changed its name to the Power Cost Equalization (PCE) program and was officially funded in FY 2001 with money from the Constitutional Budget Reserve and from the sale of the Four Dam Pool Project. The PCE fund was increased in FY2007 with general funds and now totals around $280 million. The fund is not protected by legislation and could be diverted to other needs if not defended by rural legislators.

PCE helps rural communities benefit from the availability of a central power generating plant by subsidizing the high cost of power for most customers. Residential customers and Community Facilities are eligible for PCE. Commercial and Federal/State customers are not eligible for the subsidy.

The mission of every rural electric utility should be to provide stable power as efficiently as possible, religiously maintain equipment, save to repair and replace equipment, and make the most of the PCE subsidy.

While economic development opportunities in rural Alaska can be handicapped by the high cost of power, the electric utility in itself is a business. Run properly, the utility can both provide stable affordable power and give meaning to education for local youth.

Training, personnel, and youth internship costs are allowable expenses for increasing the PCE subsidy rate. An investment in utility staff is an investment in community capacity on many levels. This curriculum is intended to help utility staff and student interns become familiar with best practices for managing the electric utility and maximizing the PCE subsidy for our community.

Glossary

Arrears – past due balance

Ballast – a device placed in line with the load to limit the amount of current in an electrical current; ex: used in fluorescent lamps and street lights

Current Transformer – look like donuts wrapped around a wire leading to a meter; used to step power

Data – bits of information

Distribution system – a series of electric lines connecting the generation source to customers

Electric Meters – mechanical or digital devices to measure electric usage

Import – bring into your community from somewhere else

Islanded-grid – a limited area with its own generation and distribution system

Legislators – elected lawmakers

Meter Base – contains the jaws the electric meter attaches to; the entry for power into the building; it is owned by the customer

Micro-grid – a limited area with its own generation and distribution system

Multiplier – the number used to calculate the correct usage in a meter with current transformers

Numerical – related to numbers

Occupant – one who lives there

Rate Class – Defined group of utility customers i.e. Residential, Commercial, Community Facility, Federal/State, or Unbilled

Rates – dollar amount charged per kWh of power used

Ratio – numbers separated by a colon : calculate the number of times the first number contains the second number

Subsidize – help pay for the cost

Surname – last name

Totalizing Meter – Displays a running total of measurement for kWhs generated by all gen-sets

Transpose – mix up the order

Urban – in the city

Acronyms

AEA	Alaska Energy Authority
FY	Fiscal Year
kWh	kilo-Watt-hour
PCE	Power Cost Equalization
RCA	Regulatory Commission of Alaska
UMR	Utility Monthly Report
YTD	Year-To-Date

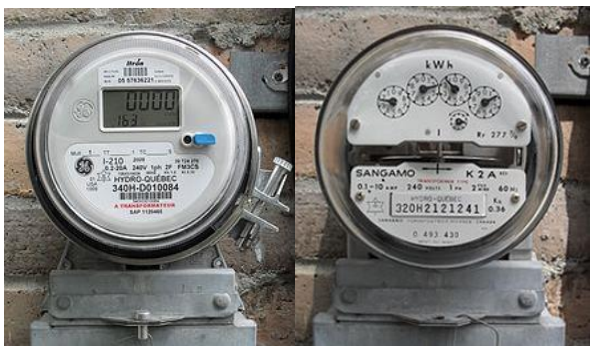
Lesson 1: Meter Reading Protocol and Rate Classes

The PCE Program uses these 5 rate classes:

RATE CLASS	DESCRIPTION	EXAMPLES
Residential (R) PCE Subsidy for first 500 kWhs	a home or apartment where people live and do not do a major business (Alaska PCE rules state that no more than 25% of a residence may be used for Commercial activities.)	
Commercial (C) No PCE	a building, or space within a building, where goods are sold, or business is done	Store, church, processing plant, corporation office, community school
Community Facility (CF) PCE Subsidy for all kWhs Up to Community Quota (current population x 70)	a building or space that benefits everybody in the community	Pump house, fire hall, tribal office, city office, clinic, VPSO office, sewer system, tank farm, community center
Federal/State (F/S) No PCE	a building or space that is paid for by either the State of Alaska or Federal Government	Automated Weather Observation Station (AWOS), Federal Aviation Administration (FAA), Department of Transportation (DOT)
Unbilled (UB)	a customer the utility chooses not to charge for power	Churches, clergy's home

Make a column for Rate Class on your meter reading sheet. That way you can sort by that category once all readings have been entered into your Excel spreadsheet.

There are two types of **electric meters** commonly found in rural Alaska. Mechanical meters are the old-time versions and are rapidly being replaced by digital electronic meters and even "smart" electronic meters in some communities. Thank goodness! Mechanical meters that use dials are hard to read correctly without good instruction. Generally installed on larger users, correct readings are important for billing, fuel efficiency, and line loss calculations. A guide for reading dial meters is included in the appendix.



Most communities have modern digital electronic meters (left). Electronic meters are easier to read, but some scroll through several different measurements and you must pick the right reading. Pick the reading labeled kWh.

Mechanical meters have dials that rotate opposite directions. Meter readers need instructions to read these correctly. When in doubt, have the meter reader take a photo to bring back to the office.

The utility is responsible for the meter and the customer is responsible for a safe, functioning **meter base**. Meter bases need to be installed by a certified electrician. Housing Authorities are sometimes able to include new meter bases in maintenance work. Utilities can help customers by bundling known jobs to spread the cost of bringing in an electrician, if needed.

Stainless steel meter bases are more expensive, but a smart long-term investment when living in a coastal community with salt spray in the air.

Some utilities will help customers acquire a new meter base when necessary, then add the charges to their electric bill.

When bringing out a licensed electrician, make sure all equipment is on hand and accounted for prior to authorizing the travel.

Why Read Meters?

Consistent and accurate meter reading must be done for several reasons:

1. By law, customers do not have to pay an electric bill that does not include their previous and current meter reads.
2. Monthly meter readings are required by the Alaska Energy Authority (AEA) for PCE payments.
    - Even if a utility has pre-paid meters, monthly meter readings must be provided to AEA to receive the PCE reimbursement payment for pre-pay customers.

3. You want to account for every kWh that gets used so you can get the best PCE rate and keep costs down for customers. If you "lose" too many kWhs, your PCE rate will go down and power will be more expensive. (We will discuss "losing" kWhs, also known as Line Loss, in more detail in Lesson 5.)

Have multiple people trained to read the meters. That way if somebody gets sick, wants to go hunting, fishing, shopping, or just needs to take time off there will always be someone else around who knows how to do the job.

If buildings are unoccupied and are expected to stay that way, remove the meter and install a meter blank to protect the insides of the meter base. Be sure to put a good meter ring and seal to keep the

blank in place. Then you don't have to check those meters anymore. I was going to tell you all the stories about creative ways to steal power I've witnessed – but I don't want to spread bad ideas. Just trust me, pulling the meter and putting a meter blank on abandoned or unoccupied buildings will save the utility a lot of headaches.

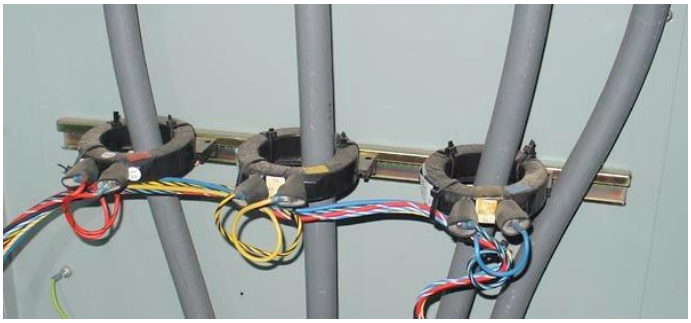
Meter blanks are inexpensive plastic covers that can be purchased from utility supply stores. A few should always be kept on hand in case you need to remove a meter. Be sure to use a meter ring and meter seal to keep the blank in place. Remove meters from unoccupied buildings so you don't have to read the meter.

The meter always stays with the house and does not follow the customer from house to house. Even pre-pay meters stay with the house. Any credit remaining on a pre-pay meter can be removed using the Field Unit Software on the laptop that came with the AMPY system. Or it can be charged to the new customer and credited/refunded to the former customer in the AMPY desktop program.

Meter Reading Protocol

- Pick a date on or near either the last day of the month or the first of the month and stick with it.
- Read the meters in the same order every month.
- Read every meter in town - even if the **occupant** (person living there) is away on vacation or something.
- Make a meter reading sheet in Excel
    - list customers in alphabetical order like the ledger or in the order that makes most sense for a meter reader to follow.
        - "Sort" by name and class to put them in alphabetical order for easy transfer to the ledger.
    - Put the **serial number** found on the face of every meter for each customer to eliminate future confusion.
    - Include previous meter readings on the meter reading sheet each month**. Transposing** (mixing up) numbers or other mistakes in readings are reduced with this practice.
- Make sure you are aware of any meters with **multipliers** that may be installed on some buildings that use a lot of power, i.e. fish processing plants, schools, warehouses, large freezers, dock cranes. If the meter has a multiplier, usage is calculated by subtracting the previous meter reading from the current meter reading and then multiplying this answer by the multiplier.
    - The multiplier may or may not be written on the face of the meter. If not sure of a multiplier, get someone who is experienced with electricity to help you.
        - If a multiplier is not written on the face of the meter, look for **Current Transformers** (CTs/Donuts) on the thick wires coming straight up from the

meter. These "donuts" will have a **ratio** (numbers separated by a : represents the number of times the first contains the second) printed on their surface. Divide the smaller number into the bigger one – that is then the multiplier.

- 

DANGER - NEVER REACH INSIDE A METER BASE – HIGH VOLTAGE

- **If you need to change a customer's meter between monthly readings** be sure to write down the last reading of the old meter and the first reading of the replacement meter. Then you will get the current reading for the new meter on meter reading day. That customer will have two lines on the ledger and totals from two separate meters for their usage that month.
- **If a customer's meter rolls over mid-month** just add a "10" to the new reading so you don't get a negative number when subtracting the previous month's reading. Then remove the "10" from the reading the next month when it becomes the previous reading.
- Get the following Power Plant and Fuel Farm information from the operators <u>for the same day you read customer meters.</u>
    - Total kWh Generated (Diesel/Wind/Hydro)
    - Peak Demand for the month
    - Station Service (for all sources of power generation)
    - Fuel Meter
    - Fuel tank measurements (operator should dip tanks monthly unless the gauge works). There are tank charts that equate inches with gallons.

See a sample plant log below for where to get monthly readings.

	Date	Generator #	Time	Inside Temp.	Outside Temp.	Exhaust Visible Y/N?	Exhaust Color**	Total Engine Hours	Coolant Temp.	Oil Pressure (PSI)	Engine Oil Level	Battery Voltage	kW Meter (Max kW)	Frequency Cycles	Voltage	Amp Line 1	Amp Line 2	Amp Line 3	Total kWh	Station Service kWh	Fuel Meter	Gallons Pumped	Operator Initials & Comments
MON	5/28/18	2	1030am	58.0	42	n	c	27272	182	55	f	25.9	33	60	##	17	27	48	2964211	143070	268224	38	cg
	5/28/18	2	907pm	58.0	40	n	c	27282	180	56	f	25.9	48	60	##	19	27	68	2964528	143101	268263	39	gk
TUE	5/29/18	2	1025am	59.0	40	n	c	27296	185	52	f	25.9	44	60	##	15	29	51	2964900	143148	268302	39	cg
	5/29/18	2	752pm	59.0	38	n	c	28305	175	55	f	25.9	40	60	##	18	28	47	2965161	143166	268302	0	gk
WED	5/30/18	2	945am	59.0	40	n	c	27319	185	54	f	25.9	42	60	##	17	27	48	2965516	143210	268340	38	cg
	5/30/18	2	805pm	58.0	40	n	c	28329	180	52	f	25.9	39	60	##	21	49	61	2965798	143244	268378	38	gk
THU	5/31/18	2	120pm	59.0	36	n	c	27347	185	55	f	25.9	42	60	##	22	28	48	2966277	143298	268416	38	cg
	5/31/18																						
FRI	6/1/18	2	0:00	57.0	40	n	c	27366	180	57	f	25.9	39	60	##	14	25	49	2966717	143350	268454	38	cg
	6/1/18	2	1005pm	58.0	38	n	c	27380	182	52	f	25.9	40	60	##	18	30	45	2967051	143386	268491	37	gk
SAT	6/2/18	2	1225pm	58.0	40	n	c	27394	182	55	f	25.9	32	60	##	18	30	50	2967412	143424	268530	39	cg
	6/2/18	2	738pm	58.0	40	n	c	28401	175	55	f	25.9	35	60	##	18	47	45	2967611	143444	268530	0	gk
SUN	6/3/18	2	0:00	59.0	40	n	c	27416	195	54	f	25.9	44	60	##	23	32	79	2968047	143497	268568	38	cg
	6/3/18	2	851pm	56.0	40	n	c	27426	175	56	f	25.9	44	60	##	17	29	49	2968293	143520	268605	37	gk
																			2964211	143070	268224		

Unless re-set monthly, use the highest number during the month.

Use readings from the same day customer meters are read.

You can enter the new customer meter readings directly onto the ledger, but we recommend entering them into the computer onto the Excel meter reading sheet. This will make for easy copy/pasting onto the ledger:

1. Type the handwritten meter readings onto the meter reading sheet in Excel.
2. Sort the data first by the Class column so that all Residential, Commercial, Community Facility, Federal/State and Unbilled customers are grouped together.
3. Sort each Rate Class alphabetically.
4. Copy the current readings for each rate class and paste them onto the ledger. As long as the customer names for the meter reading sheet and the ledger are exactly the same this will work well.

Next, prepare your meter reading sheet for next month:

1. Copy the current meter reads and paste them over the previous meter readings.
2. Clear the contents for the current meter reads in preparation for entering next month's readings.
3. Do the same for the power plant readings.
4. Print out for the meter reader.

Included in Appendix:
How to Read a Dial Meter

Included in Excel Spreadsheet Booklet:
Sample Meter Reading Sheet

Lesson 2. The Utility Ledger

Discussion

On the ledger customers are separated into the rate classes previously described and then listed alphabetically. All customers are alphabetized, residential customers by their **surname** (last name). Be sure the ledger and meter reading sheets use the same names for customers to prevent confusion.

Each customer's line on the ledger should have the following information:

- New and previous meter readings
- Total kWhs used
- PCE eligible kWhs
- Energy charge from usage
- Taxes or other charges (returned check fees/deposit/deposit return)
- PCE Credits
- Old Balance
- Payments received during the billing period
- Total Amount Due

RESIDENTIAL													
			Meter Reading		kWh Used		Energy		PCE	Current			Amount
ID#	Class	Customer Name	New	Prev	Total	PCE	Charge	Other	Credits	Activity	Old Bal	Payments	Due
111	R	Doe, Joe	34750	34523	227	227	$204.30		$131.36	$72.94	$229.73	$229.73	$72.94
114	R	East, Duey	2201	2090	111	111	$99.90		$64.24	$35.66		$100.00	

Pre-Pay Electric Meters are handled differently on the ledger. They have no past due amount nor amount due because they always pre-pay for power. No bills are required for these customers. Any old past due amounts from before the pre-pay meter was installed are accounted for in **Arrears** in the AMPY computer, but not documented on the ledger. These arrears are collected as a pre-agreed upon percentage of each payment. The space for previous balance and total due for pre-pay customers is always shaded on the ledger to acknowledge no previous balance or total due.

An Electric Rate Detail Report (ERDR) for one customer from both Residential and Community Facility rate classes which has pre-pay metering must be faxed to AEA on the first of every month. The AEA sends a reminder each month.

Math Used Across the Ledger Lines

Residential

Customer Rates (per kWh)			PCE Rate (per kWh)	
Residential	$0.90		Residential	$0.5787
Commercial	$0.90		Comm Fac	$0.5787
Comm Fac.	$0.90			
Fed/State	$0.90			

RESIDENTIAL

			Meter Reading		kWh Used		Energy		PCE	Current			Amount
ID#	Class	Customer Name	New	Prev	Total	PCE	Charge	Other	Credits	Activity	Old Bal	Payments	Due
111	R	R A	34750	34523	227	227	$204.30	0	$131.36	$72.94	$480.00	$229.73	$323.21
					34750	Same as kWh	227	$0 this month	227	$204.30			$72.94
					-34523	used, but no	X $.90		X $.5787	-131.36			$480.00
					227	more than	$204.30		$131.36	$72.94			$552.94
						500 kWhs/mo.							($229.73)
													$323.21

Usage/kWh Used

RA's meter reading at the end of last month was 34523. At the end of this month his meter reading was 34750. How much electricity did RA use over the last month?

34750 – 34523 = 227 RA used 227 kWhs last month.

PCE kWhs

RA does not have a store taking up more than 25% of his house, so RA is in the Residential Rate Class. As a Residential customer, RA gets up to 500 kWhs of subsidized power each month.

34750 – 34523 = 227 RA gets credit for 227 PCE kWhs last month.

Energy Charge

The Rate for Residential customers is $.90/kWh. How much does RA owe for the electricity he used last month?

227 X .90 = $204.30 RA owes $204.30 for power from last month.

PCE Credits

Wow! That is a lot of money! The PCE rate in RA's community is $.5787. How much will that help Joe?

227 x $0.5787 = $131.36 RA gets help from PCE for $131.36!

So how much does RA owe for 227 kWhs of power?

$204.30 Power Charge
-131.36 PCE Subsidy
$ 72.94

Current Activity
After PCE, RA owes the power utility $72.94. Much better!

Old Balance
RA didn't pay his bill last month, so he has a past due balance. How much does he owe now?

$ 72.94 Current Activity
$ 480.00 Old Balance
$229.73 Payment
($72.94 + $480.00) - $229.73 = $323.21 Including past due, RA now owes $323.21

What happens if a residential customer exceeds 500 kWhs?
This month Joe Doe's meter read 2300. Last month the reading was 1700.

2250 – 1700 = 600 kWhs
600 X $.90 = $540.00 (Residential Rate)
500 X $.60 = $300.00 (PCE Subsidy for first 500 kWhs)
$540.00 – 300.00 = $240.00

This month Joe owes the power utility $240.00. Those kWhs over 500 are very costly at $.90/kWh!

Community Facilities

Community Facility bills are done exactly like Residential bills, but all kWhs can be counted for the PCE subsidy so long as the total does not exceed the community quota. *If the quota is surpassed, the utility decides how to distribute the PCE subsidy kWhs.*

Streetlights are considered a Community Facility but are often not metered. AEA's UMR has a formula on page 2 for estimating usage based on the number of lights and the wattage of the bulbs.

- If you don't know the wattage of the bulbs, have a trained worker climb up to inspect one of the bulbs during daylight hours.
- Older bulbs in particular can use a lot of power. Ballasts with no bulbs or with burned out bulbs still use power unless turned off. This can add to high line loss if not addressed.

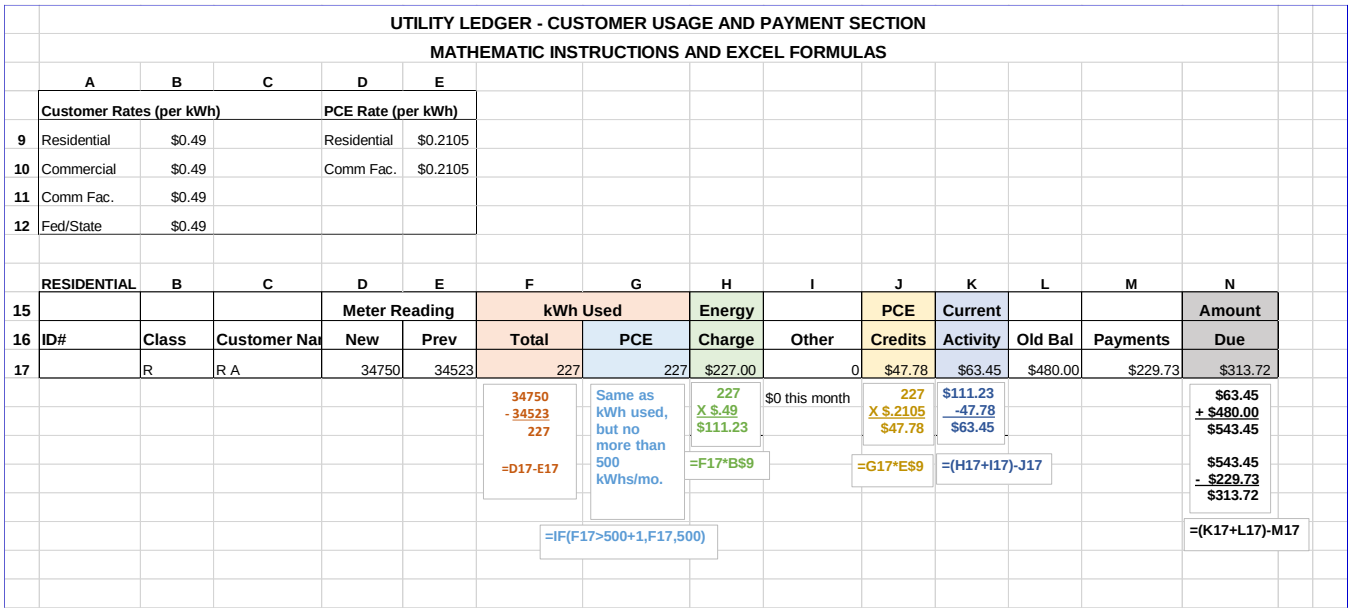
Usage in the formula is averaged over the year so you don't have to account for summer daylight and winter darkness. In order to qualify for PCE, the electric bill for the streetlights must be paid. If one light is metered, multiply its usage by the total number of streetlights.

Commercial and Federal/State

These customers do not get the PCE subsidy, therefore the bills are just a straight calculation. Subtract the previous reading from the current reading and multiply that answer by the correct rate. GCI had a meter reading of 64500 last month. This month the meter reading was 65750.

65750 – 64500 = 1250 kWhs Used
1250 X $.90 = $1,125.00 Energy Charge

Below is a ledger example with Excel formulas written below math problems.



UTILITY LEDGER - CUSTOMER USAGE AND PAYMENT SECTION
MATHEMATIC INSTRUCTIONS AND EXCEL FORMULAS

	A	B	C	D	E
	Customer Rates (per kWh)			**PCE Rate (per kWh)**	
9	Residential	$0.49		Residential	$0.2105
10	Commercial	$0.49		Comm Fac.	$0.2105
11	Comm Fac.	$0.49			
12	Fed/State	$0.49			

	RESIDENTIAL	B	C	D	E	F	G	H	I	J	K	L	M	N
15				Meter Reading		kWh Used		Energy		PCE	Current			Amount
16	ID#	Class	Customer Nar	New	Prev	Total	PCE	Charge	Other	Credits	Activity	Old Bal	Payments	Due
17		R	R A	34750	34523	227	227	$227.00	0	$47.78	$63.45	$480.00	$229.73	$313.72

34750
- 34523
227

=D17-E17

Same as kWh used, but no more than 500 kWhs/mo.

=IF(F17>500+1,F17,500)

227
X $.49
$111.23

=F17*B$9

$0 this month

227
X $.2105
$47.78

=G17*E$9

$111.23
-47.78
$63.45

=(H17+I17)-J17

$63.45
+ $480.00
$543.45

$543.45
- $229.73
$313.72

=(K17+L17)-M17

Be very careful and thorough when completing this ledger as a mistake can create problems down the line with:

- Customer Accounts
- PCE Payments from AEA
- Line Loss Calculations
- Fuel Efficiency Calculations
- Utility's PCE rate from the RCA

Data Summary Table and Year-To-Date Spreadsheet

We set up our monthly ledger so that the last page summarizes all the month's statistics in a format for easy transfer to a Year-To-Date spreadsheet.

Included in Excel Spreadsheet Booklet:
Sample ledger with data table
YTD spreadsheet

Total kWh's Generated		4022073	3984228	37,845	**No. of Customers**			**Fuel Efficency**	17.23	**kWh/gallon**	
Station Service		297675	295934	1,741	Residential	35		**Line Loss**	11.8%		
Peak Demand				102	Commercial	14					
Fuel Use Record		340442	338245	2,197	Com Fac	8		**RCA Standards**	**10.5**	**kWh/Gallon**	
					Federal/State	9		**Line Loss**	**12%**		
					Unbilled	6					
					Total	72					
	kWh Gen	**SS**	**Fuel Used**	**Peak**							
	37,845	**1,741**	**2,197**	**0**							
	Res	**Comm**	**CF**	**F/S**	**School**	**Unbilled**	**Totals**				
Total kWh Sold:	**10,787**	**10,795**	**3,375**	**1,026**	**4,520**	**1,138**	**31,641**				
Gross Billed Rev:	**9,103.50**	**11,874.50**	**3,375.00**	**1,128.60**	**4,972.22**	**0.00**	**30,453.82**				
Payments:	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0**	**0.00**				
PCE kWh:	**9,078**		**3,256**		**0**	**0**	**12,334**				
PCE Rate:	**0.3817**		**0.3817**								
PCE Dollars:	**3,465.07**		**1,242.82**				**4,708**				
PCE Rec'd:											

If you keep up with the YTD spreadsheet monthly, the Annual Report is not so daunting. Information from this spreadsheet can be copied and pasted directly onto page 5 of the annual report form. The breakdown of kWhs and collections by rate class is useful when doing a rate analysis.

There are formulas pre-set on the sample YTD *included in the appendix* to calculate Fuel Efficiency, System Efficiency (if you have a Hybrid System) and Line Loss on the kWh Generated - Fuel Info tab. It is the annual average for fuel efficiency and line loss that matter to the RCA, but as utility overseer you should track these numbers monthly and make a note to the power plant operators if you see any changes from month to month.

Lesson 3. Customer Billing

Rate Classes may have different rates, but customers within a Rate Class must all have the same rate (although larger users, such as schools or processing plants, may get a reduced rate within their rate class).

Options

- Excel is the easiest program to use for customer billing, especially with fewer customers.
    - Copy a customer's line directly from the ledger onto another Excel spreadsheet that has been formatted as a customer bill. *An example bill is included in appendix.*
    - A year's worth of bills can be included on this spreadsheet, so customers can track their usage and payment information throughout the year.
- A mail merge template can be created in Word for larger utilities that can be tied to the Excel ledger.
- QuickBooks can be used for billing. If all other bookkeeping is done in QB, this makes sense – otherwise you are doing the job twice.
    - This should be set up by someone who understands billing in QuickBooks as it is easy to make, and complicated to correct, a mistake.
    - You could enter monthly billing and collection totals for each rate class in QB as an alternative to doing individual customer bills in QB.
    - For QB Assistance Contact the QuickBooks Hotline 907-440-0242
      Monday, Tuesday, Thursday from 10 a.m. to 3 p.m.
- There are a variety of professional utility billing programs used by larger utilities, but these require regular updates and often high annual fees. These costly programs are not a good fit for small utilities.

How ever billing is done, customer accounts should match the ledger.

Included in Excel Spreadsheet Booklet:
Sample Electric Bill

Included in Appendix:
Directions for Mail Merge Billing Available on Request

Power Cost Equalization Subsidy – or Not

The State of Alaska's Power Cost Equalization (PCE) program subsidizes Residential Customers "in good standing" with the utility for the first 500 kWhs of power usage within a month. The state will not subsidize customers that don't pay their bills. If pre-pay meters are installed at the utility and are

collecting arrears, AEA will allow such customers to receive the PCE subsidy again without having to pay off the entire past due balance first.

The PCE program also subsidizes Community Facilities. Each community has a **quota** (limited amount) of subsidy kWhs for CFs. The individual quotas are determined by multiplying the *official population by 70. A community with a population of 100 would get 100 X 70 = 7,000 kWhs each month to subsidize CF usage. CFs can get the subsidy on ALL kWhs used so long as the total of all the facilities does not pass the quota. In such a case, the utility determines where to apply the subsidy.

Commercial, Federal, and State customers are not eligible for PCE.

** The Official Population is estimated every year by the Alaska Department of Commerce and Economic Development. Estimates are released every year on July 1st. Communities have 15 days to dispute the estimate.*

Lesson 4. Utility Monthly Report (UMR) to AEA

Recommendations / Tips

- Always review your ledger before printing it to use for completing the UMR by scanning down the Total kWh Used column looking for negative numbers or "out of the ordinary" usage numbers for each customer, keeping in mind:
    - Residential customers rarely surpass 500 kWhs in a month as this is the limit for PCE subsidy
    - The largest user in most communities is the school
    - Water plants often use above average energy during summer months when pumping water to fill storage tanks
        - *If the water plant using more power than usual, let the water plant operator know - there could be a leak somewhere causing the pumps to run more than necessary.*
- Check formulas regularly (especially in the Totals rows) to make sure nothing has been accidentally changed or not changed when it should have been.
    - Totalizing cell formulas should include all the cells in their column. Sometimes if a customer is added, the totalizing cells will need to be changed. Check to be sure.
- Review generation statistics to make sure nothing seems wrong. Compare to previous months if you are not sure.
    - If any of these calculations are very different from what is normal, that is a good indication of a problem, such as:
        - An incorrect meter reading – either in generation or for one or more customers
        - An error in a formula(s) on the ledger
        - A problem with generation equipment
        - A problem with the distribution system

If you notice a change in line loss or efficiency and can't find a mistaken meter reading or math error, notify your power plant operator(s) immediately.

The **Utility Monthly Report (UMR)**, and all supporting documentation, is required by AEA for the utility to be reimbursed for the PCE subsidy provided to customers. The information for the UMR comes directly off the Customer Ledger, except for the non-fuel expenses. Non-fuel expenses come from your QuickBooks Profit & Loss Summary Report. Make the report for the same dates as the meter readings.

Included in Appendix:
Sample UMR Form with Directions

When completed, the utility must submit all the following to AEA to receive a subsidy check:

- Monthly Customer Ledger (you can omit the final summary page if nothing else is on its page)
- Completed UMR form
- A copy of one Residential Bill (unless all customers are on pre-pay metering)
- A copy of one Community Facility Bill
- If any customers are on pre-pay metering, an Electric Rate Detail Report is required to be faxed to AEA on the first of every month

Creating the Ledger for the Next Month

Once the ledger is complete and correct, you make a copy and set it up for the next month's entries.

Included in Appendix:
Directions for Creating Next Month's Ledger

Lesson 5. Fuel Efficiency

Discussion

To be efficient is to not waste, to make the most of something. Knowing the fuel efficiency of your utility's generators is important. You want to generate power efficiently, so you don't have to buy more fuel and pay for even more fuel to transport that fuel to your community. It's expensive to have to **import** energy stored as liquid fuel.

Many of Alaska's remote communities have begun to take advantage of the rivers, the sun, and the wind for power. They want local power that never runs out. Switching to renewable energy seems like a no-brainer. Diesel fuel is expensive to buy and to transport, it smells bad, requires expensive storage, and contaminates things when it spills.

But all energy comes with a price. Making renewable energy work alongside diesel generators is not as easy as we wish. Gusts of wind and clouds passing over the sun change power output suddenly. A complicated control system and power quality equipment is necessary, or everybody's TV and other appliances can get ruined. Who knew?

Rural Alaska leads the world in developing these kind of hybrid (mixed sources of energy) micro-grids. Some people call these efforts "cutting edge". Others, whose projects have failed, call it "the bleeding edge". Trial and error are how progress gets made, though. Lessons learned lead to eventual success. There are success stories, but success does not come cheap.

Calculation

Fuel efficiency is calculated by dividing the total number of kWhs generated by the diesel generators by the number of gallons of diesel fuel consumed/used in the process.

For PCE purposes generation fuel efficiency standards were established by the Regulatory Commission of Alaska/RCA to encourage efficient and economical diesel generation of electricity.

Regular maintenance, including changing fuel filters and making sure there are no contaminants (generally dirt or water) in the fuel, are ways to keep fuel efficiency high. Running generators at their proper load is another. For example, if you have a 100-kW generator and a 60-kW generator, run the 60 kW at night if the load is only 35 kW.

Power plant operators used to have to manually switch to the best sized generator for the load. Switching generators was not always done in a timely way, resulting in lower fuel efficiency. Now, automated controls do the switching immediately as the load changes. Automated controls have improved efficiencies by as much as 2-5 kWhs per gallon. Over the course of a year, this adds up to significant fuel savings.

The standard for fuel efficiency developed by the RCA varies based on utility size. Minimum fuel efficiency standards are directly related to the total annual kWhs of diesel generation. Efficiency

expectations are reduced for utilities that produce 20% or more of their power with renewable energy. It is assumed the diesel generators will not perform their best if often run at low loads alongside the renewable energy. Adding batteries to such systems may eliminate this inefficiency in future hybrid power plant designs.

Utilities that do not achieve the standards set for a utility of their size get a reduced PCE subsidy. The RCA will reduce the gallons of fuel actually used to adjust for low fuel efficiency when calculating the PCE rate. Reducing the real number of gallons used negatively affects the PCE subsidy rate for a utility's customers.

For a utility that uses diesel fuel to generate more than 80% of its total kWhs generated:

Annual Diesel Generation	**Efficiency Standard**
< 100,000 kWhs	9.5 kWhs/gallon of diesel fuel consumed
100,000 – 499,999 kWhs	10.5 kWhs/gallon of diesel fuel consumed
500,000 – 999,999 kWhs	11.5 kWhs/gallon of diesel fuel consumed
1,000,000 – 9,999,999 kWhs	12.5 kWhs/gallon of diesel fuel consumed
10,000,000 + kWhs	13.5 kWhs/gallon of diesel fuel consumed

For a utility that uses diesel fuel to generate less than 80% of its total kWhs generated:

Annual Diesel Generation	**Efficiency Standard**
< 100,000 kWhs	8.5 kWhs/gallon of diesel fuel consumed
100,000 – 499,999 kWhs	10.0 kWhs/gallon of diesel fuel consumed
500,000 – 999,999 kWhs	11.0 kWhs/gallon of diesel fuel consumed
1,000,000 – 9,999,999 kWhs	12.0 kWhs/gallon of diesel fuel consumed
10,000,000 + kWhs	13.0 kWhs/gallon of diesel fuel consumed

A lower than the acceptable standard fuel efficiency can be caused by several things.

- A mistake was made in reading or writing down the total kWh generated or fuel meter readings
- The totalizing meter at the generation plant isn't working properly or isn't being read properly
    - A multiplier is not being applied or is applied incorrectly
    - The meter is not wired correctly
- Something is wrong with the fuel meter
- Something has contaminated the fuel
    - Regular testing of fuel is recommended
- The diesel(s) being run are not sized right for the community load
- There is a maintenance problem with the gen-set(s) being run
    - Fuel injectors might need replaced

Always let the power plant operations and maintenance person(s) know when a change in fuel efficiency is noted when completing your reporting. Although they may have already noticed if it is a generator problem, they may not be aware of metering problems.

Practice

The formula to Calculate Fuel Efficiency is:
Total kWhs Generated divided by Gallons of Diesel Consumed

Example:
In January, the utility generated 46,000 kWhs. The station service at the power house was 2,342 kWhs. The generators used 3,412 gallons of diesel. The utility sold 43,163 kWhs.

46,000 / 3412 = 13.48 kWhs/gallon

What is your fuel efficiency? What should it be?

Included in Appendix:
Fuel Testing Labs

Lesson 6. Line Loss

Discussion

In the utility world, line loss is generally defined as the energy waste resulting from the transmission of electrical energy across power lines. These losses occur due to the conversion of electricity to heat and **electromagnetic energy**. A small amount of loss occurs even in the most efficiently engineered systems.

For our purposes, line loss is the difference between how many kWhs the power plant generates and how many kWhs can be accounted for as sold, used but not billed, or used by the power plant.

The formula to calculate line loss and express it as a % is as follows:

Line Loss = ((Total kWh Generated – Station Service) - Total kWh Sold)/Total kWh Generated

For example:

In January, the utility generated 46,000 kWhs. The station service at the power house was 2,342 kWhs. The utility sold 42,163 kWhs. What was the line loss?

((46,000 – 2,343) – 41,163) / 46,000

= (43,657 – 41,163) / 46,000

= 2,494 / 46,000

= .05 x 100%

= 5%

To encourage efficient and economical generation and distribution of electricity the Regulatory Commission of Alaska (RCA) set a standard for line loss in rural utilities at no more than 12%. While 12% is the maximum, 6% is a better goal.

The PCE Utility Monthly Report (UMR) for AEA automatically calculates line loss from **data** entered on the form. Because tracking line loss can identify problems, the utility should calculate their own line loss on each monthly customer ledger and transfer the data to an Annual Energy Summary Spreadsheet. That spreadsheet is useful to monitor the health of your utility.

If the line loss of any one month is lower than 0% or higher than 12%, you could have a **numerical** mistake somewhere or there could be a maintenance problem that needs to be addressed. Consider the following possibilities:

1. Not all meters were read on the same day.

   a. If the power plant meter readings come from days after all customer meters are read, there could be high line loss.
   b. If the power plant readings come from days before all customer meters are read, there could be negative line loss.
2. One or more meter readings were missed or not entered correctly on the customer ledger
   a. Review customers' usage, looking for anything unusual
      i. Unusually high or low usage
      ii. Negative usage
      iii. Was a meter changed?
3. One or more customer meters is not working correctly (this is very rare)
   a. Question customers with unusual usage regarding a change in behavior or use of appliances. Replace the meter if it appears nothing else is out of the ordinary.
      i. If replacing the meter does not fix the problem, it is a problem with the wiring of the home or an appliance with an electrical short. This is the customer's problem to fix (the utility is only responsible for power from the generation plant to the customer's meter – everything "**behind the meter**" is the customer's responsibility)
         1. Older electric water heaters are often problems. Check metered usage for a 24-hour period. Find the breaker to the water heater and turn it off. Check the kWh usage 24 hours later to see if there is a significant drop in usage.
         2. If pre-pay meters are installed, you can test multiple appliances by turning everything off and turning them on one at a time. The difference will be obvious almost immediately on the Customer Information Unit menu feature that shows cost per hour in real time.
4. The multiplier on a customer meter (typically a large user like the school or water plant but could be on a large freezer in a store or fish plant) is not accounted for or not correct on the ledger.

THE FOLLOWING PROBLEMS REQUIRE A CERTIFIED ELECTRICIAN/LINEMAN TO ADVISE, ASSESS AND/OR REPAIR
HIGH VOLTAGE ELECTRICITY IS DANGEROUS

5. The **Totalizing Meter** at the power plant is not working correctly.
   a. Could be wired wrong
   b. Could be old or damaged and need replaced.
6. There is a short somewhere along the distribution system.
   a. Check for tree limbs or debris touching wires.

   b. If wiring is underground, you may need a lineman with equipment to detect electrical shorts underground.
7. A transformer is on, but not powering any customers or equipment.
   a. Transformers with no active loads should be turned off as they use power whether in use or not.
8. Streetlight usage is not accounted for. Older bulbs used a lot of power. Ballasts with broken or burned out bulbs still use power unless disconnected.

Investigate line loss every time. Often it is a math error, but sometimes it could indicate a real problem that should be fixed.

Lesson 7. Fuel Report to the RCA

Discussion

The RCA requires every non-regulated electric utility to complete and submit a Fuel Report Form for diesel fuel purchased for generation purposes. Reporting periods and dates are unique and based upon the number of times the utility purchases fuel within a year. Some utilities get fuel weekly and must report monthly while others get one barge delivery annually, so report only once per year.

It costs your utility $39 every time the RCA reviews a fuel report.

If you are new to the utility job and don't know your reporting dates, contact the person in charge of non-regulated electric utilities at the RCA (907-276-6222 or 800-390-2782) and ask. Forms are located on the RCA website.

State of Alaska Motor Fuel Tax Exemption

Unlike fuel intended for transportation, diesel fuel purchased for the power plant is not subject to the State of Alaska Motor Fuel Tax (currently $0.08/gallon).

Complete a State of Alaska Tax Exemption form the first of every year and submit this to all fuel vendors to not to get charged this tax.

Check all fuel invoices for erroneous tax charges.

If you were not aware of this and have been charged the tax, there is another form to request a refund of these taxes from the State of Alaska.

Included in Appendix:

- *MotorFuelTaxExemption*

Included in Excel Spreadsheet Booklet:

- *Claim for Refund on Motor Fuel Taxes*

Delivery Charge/Mark-Up

If the location for your fuel deliveries requires the utility to transport fuel from this site to the tank farm, you can account for all those costs and add a per/gallon charge to your fuel report for delivery charges. You will need to update this cost annually and submit your documentation to the RCA along with the fuel report.

You can also include the costs to operate the tank farm in the mark-up. These costs must be provided in detail with back-up to the RCA along with the first fuel report of your reporting year.

Included in Excel Spreadsheet Booklet:
Template for Fuel Farm Cost of Operations/Mark-Up Calculation

Information Required for the RCA Fuel Report Form

1. Total amount of fuel storage available to the utility
    - If you don't know this answer:
        - Ask the fuel farm operator which tanks belong to the utility
        - Find a one-line drawing of the tank farm. The tanks should be labeled as vertical or horizontal along with the gallons of storage and the contents (diesel or gas). Add up all the utility's diesel tank capacity for the total amount of fuel storage for the utility.
        - If you can't find a one-line drawing, go to the tank farm and look at the tanks yourself. Each is labeled with its number, how many gallons it will hold, and what kind of fuel is inside. Make your own list of tanks with their capacity and contents.
2. How much fuel was on hand prior to the first delivery:
    - Ask the tank farm manager to dip each diesel tank prior to the delivery and document how many inches were in each tank.
    - Using the proper tank chart, equate inches with gallons of fuel.
    - Add contents of each tank together for answer to how much fuel was on hand.
3. The last weighted average fuel price approved by the RCA:
    - This number is stated on the most recent Letter Order from the RCA following the last evaluation of a fuel report. An official memo is always sent to the utility justifying the new PCE rate.
        - Each such memo should be kept in a hard copy file at the utility office, but if it is nowhere to be found, all of this is public information and "easily" found on the RCA website, www.rca.gov.
        - Learning to navigate the RCA website is well worth the effort. You can find all correspondence to your utility on this website – as well as every other utility in the State of Alaska.
4. Gather all fuel invoices for deliveries during the reporting period.
    - Put the invoice number, delivery date, number of gallons delivered, cost per gallon, and delivery/mark-up per gallon.
        - Total Cost will be calculated for you.
        - Total Gallons and Cost Totals for Reporting Period will be calculated for you
        - New Weighted Average Cost per gallon will be calculated for you
5. Fax your Fuel Report to the RCA at 907-276-0160, Attn: Finance Section.
    - Include copies of each invoice listed on the fuel report with the form

Once the RCA has reviewed your fuel report, they will send your utility an updated PCE rate based upon the new weighted average fuel price. The review will cost your utility $39. This is an allowable cost for the purposes of calculating your PCE rate.

Included in Appendix:
Sample RCA Fuel Report Form with Directions
Guide to RCA Website for Finding Documents

Included in Excel Spreadsheet Booklet:
Blank Fuel Report Form

Lesson 8. Annual Report to the Regulatory Commission of Alaska for Non-Regulated Utilities Eligible for Power Cost Equalization.

Discussion

The Regulatory Commission of Alaska (RCA) requires all non-regulated electric utilities to submit an annual report to maintain eligibility for the PCE program.

Utility data must be listed by month:

- Total kWhs generated by source
- kWhs purchased
- Station service
- Gallons of fuel used
- kWh sales

Revenue and expenses need to be clearly presented in the format requested and must be verifiable, meaning the RCA will ask for invoices and proof of payment if the report is reviewed.

Capturing all expenses, being able to support the expenses with invoices, and maintaining generation efficiency and line loss within RCA requirements is key to maximizing the PCE subsidy rate. Setting customer rates too low can reduce the PCE subsidy, so be sure your rates are high enough to cover costs.

The RCA provides a detailed report to the utility if they do a review, which usually happens once every three years. The report provides important details:

- Which expenses were accepted
- Which expenses were rejected and why they were rejected
- States fuel efficiency and line loss, outlining any corrections required to kWhs sold or fuel usage if RCA set limits are not met
- READ THIS REVIEW as soon as it arrives!
    - The utility has only 15 days from the date they receive the Review and the Letter Order is published setting the new PCE rate to question or dispute the RCA's analysis.

TIP: *If your utility has unusual expenses outside the every-third-year review process, you can request a review. A review costs $471 but is worth the cost if the PCE rate will significantly increase.*

How to Get the Right Report Form

The most current annual report forms can be found on the RCA website www. rca.alaska.gov.

On the RCA website:

- Select the tab RCA Library and in the drop-down menu select Forms Library
- Check "View Forms by Utility Type"

  - Select “Electric”
- Select the PCE Annual Report Form for Non-Regulate Utilities for the correct period ending date for your utility

You can download the report as an Excel file and save it to your computer for later use.

Directions for the report are included on the first tab of the Excel Annual Report Form, but we found the additional information provided below makes for a more thorough and accurate report and provides information consistent with that submitted to AEA for monthly reports. It has increased our PCE rate.

Income Statement – Page 4

- Get the Revenue by Rate Class numbers on the Income Statement from the *Year-To-Date (YTD) Excel Spread-sheet*.
  - The numbers on the YTD come directly from the ledgers submitted to AEA for the monthly PCE reports, so what the RCA gets is sure to match AEA’s numbers.
- Income from the PCE program should be entered on page 4A under “Other” revenue.
  - Totals from page 4A automatically transfer to the appropriate cell on page 4.
- We use QuickBooks to manage our finances
  - Consistently code payments properly so all expenses are documented, and the reporting process is not too time consuming
  - See the *Chart of Accounts* included with this lesson for proper expense coding.

TIP: Keep all invoices in an orderly filing system so they can easily be found when requested by the RCA to prove an expense. We file by type of expense as listed on the Income Statement (multiple vendors may be filed within a category) and we keep only the current year’s invoices in the active drawer. Invoices from previous years are archived in boxes clearly labeled by year.

TIP: If QB coding is not consistent with page 4A, export the Detailed Profit & Loss Statement for the year in Excel. Once in Excel, you can move expenses around to match the Income Statement. Make sure your spreadsheet totals each category correctly. Provide the RCA with both the original and the re-arranged Excel spreadsheets.

Expenses Explained

Keeping personnel costs down and cutting corners on maintenance may seem like the right thing to do to keep customer rates low, but it will also make the PCE rate lower and likely reduce the sustainability of the utility as a business. The customer won’t see much, if any, difference in their monthly bills if you increase expenses to improve operations, increase rates to cover expenses, and then earn a higher PCE subsidy rate.

A successful utility will:

- Pay staff a living wage so skilled personnel will stay on the job
- Provide staff ongoing training opportunities

- Cross-train staff
- Provide raises to employees who successfully complete training
- Consider hiring student interns so future employees are in the pipeline
- Put money into preventive maintenance for generation and distribution systems
- Be proactive on repairs or replacements
- Save money for large repairs or replacements **(This expense does not count for calculating the PCE subsidy until it is spent!)**

TIP: *If the utility office and staff is shared amongst multiple programs allocate office rent, office utilities – phone/fax/internet, office supplies, and staffing costs appropriately amongst the other programs and the utility. The parent company should invoice the utility and the utility should pay it, so the RCA will be sure to accept the costs. This can be done on a monthly or annual basis.*

TIP: *If the electric utility lacks funds from collections and is owned by the same entity that owns the fuel utility, subsidize the electric utility's fuel through Municipal Revenue Sharing, Fish Tax, or General Funds. All fuel costs will still count when calculating the PCE subsidy rat, and the non-fuel expenses will all count towards calculation the PCE rate. Document the amount subsidized on page 4A as "other revenue".*

Generation and Sales Data for the Report (PCE Data - page 5)

We set up our monthly ledger so that the last page summarizes all the month's statistics in a format for easy transfer to the YTD spreadsheet.

If you keep up with the YTD spreadsheet monthly, the Annual Report is halfway done. Information from this spreadsheet can be copied and pasted directly onto page 5 of the annual report form.

There are formulas pre-set on the sample YTD included with this lesson to calculate Fuel Efficiency, System Efficiency (if you have a Hybrid System) and Line Loss on the kWh Generated - Fuel Info tab. It is the annual average for fuel efficiency and line loss that matter to the RCA, but as utility overseer you should track these numbers monthly and make a note to the power plant operators if you see any changes from month to month.

Depreciation and Amortization (page 6)

See the Depreciation and Amortization Lives per RCA attachment for how many years to put for the life of repairs, parts, equipment, or excess expendable supplies.

The RCA, when doing a review of your annual report, will move items from Expenses to Depreciation if the item or service is expected to benefit the utility for more than one year.

TIP: Be sure not to expense items that could go on the Depreciation/Amortization Schedule - especially in years when your report will not be reviewed. The RCA may not allow them to be moved in subsequent years when the report is reviewed.

Rate Setting and PCE Rate Prediction

Setting rates is basically adding up all the costs for producing power and dividing by the number of kWhs your utility can sell. Rates within a customer class must be the same, but there is no rule about all customer classes being the same.

The YTD calculates total kWhs sold to each rate class. Knowing this is very useful as you can play around with different rates for different classes and see how it affects your bottom line.

You can have a two-tiered rate. One option is to make the PCE customers' rates high for the first 500 kWhs then drop it at 501+. This allows communities with high costs to take full advantage of the PCE subsidy but prevents hardship for customers that go over 500 kWhs in a month. With the introduction of piped water and waste water systems in rural Alaska, many customers now find themselves going over 500 kWhs in a month.

Increasing PCE customer rates can allow for a slight decrease in Commercial or School rates.

See the spread-sheet *Rate Analysis and PCE Rate Prediction in Excel.* It is a useful template.

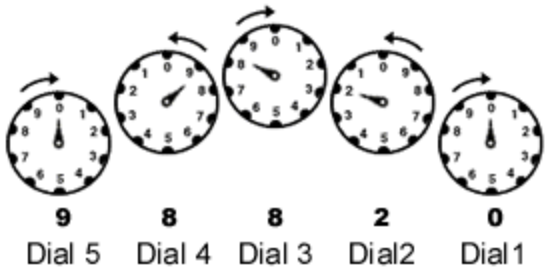
Included in Appendix:
Chart of Accounts for Income Statement
Depreciation and Amortization Lives per RCA
Power Cost Equalization Program Contacts for Reporting

Included in Excel Spreadsheet Booklet:
Depreciation Worksheet
Rate Analysis
PCE Rate Prediction

Appendix:

How to Read a Dial Meter

Read your dial meter from right to left. If a hand is between 2 numbers, use the lower number. If a hand is directly on a number, view the dial to its right. And if the hand hasn't moved past 0, write the number 1 lower than the number at which the dial's pointing.



0 - Dial 1 is 0
2 - Dial 2 is 0/10 past 2
8 - Dial 3 is 2/10 past 8
8 - Dial 4 is 8/10 past 8
9 - Dial 5 is 8/10 past 9

Dial 1: The hand points at 0. Read the first number as 0.

Dial 2: The next dial must be 0/10 past a number, because the dial to its right is 0. It's hard to tell if the second dial has reached 2. Consult the last dial to decide if you should read this dial as 1 or 2. Because the last dial was 0, read this dial as 2.

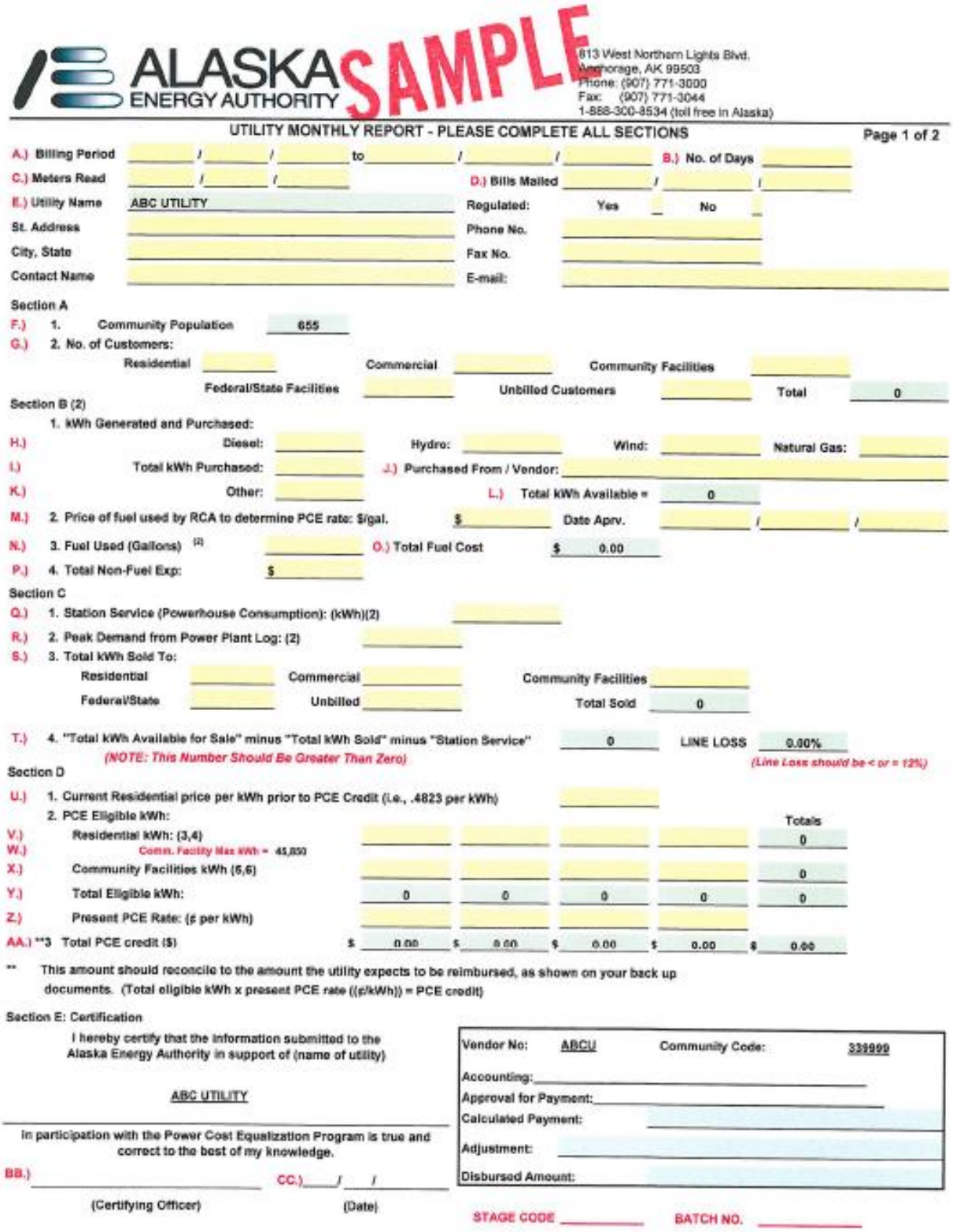
Dial 3: The 3rd dial is between 8 and 9. The dial to its right is 2 so it must be 2/10 past a number. Read the third dial as 8.

Dial 4: The 4th dial is between 8 and 9, but closer to 9. The dial to its right reads 8 so this dial is 8/10 past 8.

Dial 5: The last dial appears to point at 0, but the dial to its right hasn't passed 0 so read this dial as 9.

It helps to think of a dial on this meter as a clock. When a clock reads 1:59, the hour hand appears to point at 2, but because the minute hand hasn't passed 12, we read the hour as 1:00.

Sample Utility Monthly Report/UMR and Directions for Completion



ALASKA ENERGY AUTHORITY **SAMPLE**

813 West Northern Lights Blvd.
Anchorage, AK 99503
Phone: (907) 771-3000
Fax: (907) 771-3044
1-888-300-8534 (toll free in Alaska)

UTILITY MONTHLY REPORT - PLEASE COMPLETE ALL SECTIONS Page 1 of 2

A.) Billing Period ___/___/___ to ___/___/___ B.) No. of Days ___

C.) Meters Read ___/___/___ D.) Bills Mailed ___/___/___

E.) Utility Name ABC UTILITY Regulated: Yes __ No __

St. Address ___ Phone No. ___

City, State ___ Fax No. ___

Contact Name ___ E-mail: ___

Section A

F.) 1. Community Population 655

G.) 2. No. of Customers:

Residential ___ Commercial ___ Community Facilities ___

Federal/State Facilities ___ Unbilled Customers ___ Total 0

Section B (2)

1. kWh Generated and Purchased:

H.) Diesel: ___ Hydro: ___ Wind: ___ Natural Gas: ___

I.) Total kWh Purchased: ___ J.) Purchased From / Vendor: ___

K.) Other: ___ L.) Total kWh Available = 0

M.) 2. Price of fuel used by RCA to determine PCE rate: $/gal. $ ___ Date Aprv. ___/___/___

N.) 3. Fuel Used (Gallons) [2] ___ O.) Total Fuel Cost $ 0.00

P.) 4. Total Non-Fuel Exp: $ ___

Section C

Q.) 1. Station Service (Powerhouse Consumption): (kWh)(2) ___

R.) 2. Peak Demand from Power Plant Log: (2) ___

S.) 3. Total kWh Sold To:

Residential ___ Commercial ___ Community Facilities ___

Federal/State ___ Unbilled ___ Total Sold 0

T.) 4. "Total kWh Available for Sale" minus "Total kWh Sold" minus "Station Service" 0 LINE LOSS 0.00%

(NOTE: This Number Should Be Greater Than Zero) *(Line Loss should be < or = 12%)*

Section D

U.) 1. Current Residential price per kWh prior to PCE Credit (i.e., .4823 per kWh) ___

2. PCE Eligible kWh:

						Totals
V.)	Residential kWh: (3,4)					0
W.)	Comm. Facility Max kWh = 45,850					
X.)	Community Facilities kWh (5,6)					0
Y.)	Total Eligible kWh:	0	0	0	0	0
Z.)	Present PCE Rate: (¢ per kWh)					
AA.)	**3 Total PCE credit ($)	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00

** This amount should reconcile to the amount the utility expects to be reimbursed, as shown on your back up documents. (Total eligible kWh x present PCE rate ((¢/kWh)) = PCE credit)

Section E: Certification

I hereby certify that the information submitted to the Alaska Energy Authority in support of (name of utility)

ABC UTILITY

in participation with the Power Cost Equalization Program is true and correct to the best of my knowledge.

BB.) ___ (Certifying Officer)

CC.) ___/___/___ (Date)

Vendor No: ABCU Community Code: 339999

Accounting: ___

Approval for Payment: ___

Calculated Payment: ___

Adjustment: ___

Disbursed Amount: ___

STAGE CODE ___ BATCH NO. ___

SAMPLE

POWER COST EQUALIZATION PROGRAM - FY2013
UTILITY MONTHLY REPORT FOR COMMUNITY FACILITIES

Utility Name: ABC UTILITY

DD.) Billing Period: 0 / 0 / 0 to 0 / 0 / 0

EE.) Name of Community Facility (5) (If not listed here, please list in backup data)	FF.) kWh Usage RATE 1	FF.) kWh Usage RATE 2	FF.) kWh Usage RATE 3	FF.) kWh Usage RATE 4	Total
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
GG.) Total Eligible Community Facility kWh: (6)	0	0	0	0	0
HH.) Present PCE Rate (cents/kWh)	x	x	x	x	
II.) ** Total PCE credit ($)	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00

***This $ amount should reconcile to the amount the utility expects to be reimbursed, as shown on your backup documents. (Total eligible kWh x present PCE rate ((¢/kWh)) = PCE credit)*

JJ.) Street Lights:

If street lights are unmetered, use the following formula in calculation monthly kilowatt-hour usage:

Wattage of Bulb	x	12 Hours a Day	x	365 Days	/	1000 kWh	/	12 Months	=	Usage Per light	x	No. of Lights	=	Eligible kWh
	x	12	x	365	/	1000	/	12	=	0	x		=	0

Number of Street Lights		Metered		Unmetered	
Wattage of Bulb					

Footnotes/Definition:

(1) If more than one community is served by a utility, a total system report must be submitted in addition to a monthly report for each community.

(2) Power Plant Operator should be recording this meter reading daily and entering it into the Plant Log.

(3) Residential customers are eligible for PCE credit up to 500 kwh per month per customer.

(4) Commercial customers and Federal and State offices/facilities are excluded from receiving PCE credit.

(5) "Community Facility(ies)" means a water and sewer facility, public outdoor lighting, charitable educational facility, or community building whose operations are not paid for by the State, Federal Government, or private commercial interest.

(6) Community facilities, as a group, can receive PCE credit for 70 kwh per month multiplied by the number of residents in the community. (70 kWh x DCRA certified population).

LEGEND FOR PAGES 1 & 2 OF THE PCE MONTHLY UTILITY REPORT FORM:

THIS FORM SHOULD BE SUBMITTED TO AEA WITHIN 10 DAYS AFTER THE BILLING PERIOD ENDS.

A. Enter the date of your billing period in this space. (Example: 7/1/14 – 7/31/14)

B. Enter the number of days in the billing period in this space. (Example: 30 or 31)

C. Enter the date your meters were read in this space. Meters should be read on the same day every month.

D. Enter the date your bills are mailed to your customers in this space. (Example: 7/31/14)

E. Enter your utility's information in this space. Forms for the fiscal year 2013 or later will have the name of your utility pre-printed for your convenience. The contact name should be the same person that fills out your monthly PCE report. This is especially helpful if the Alaska Energy Authority should have any questions while processing your monthly report.

If you are not sure as to whether your utility is a "Regulated" or "Unregulated" utility, please call the Regulatory Commission of Alaska (RCA) at 907-276-6222 or toll free at 1-800-390-2782.

F. Forms for the fiscal year 2013 or later will have the community's population figure pre-printed for your convenience. This number should represent the figure published by the DCCED and mailed to you each year in the month of January. Once this figure has been deemed as officially certified by DCCED (usually June of that same year), it will be used by the AEA for purposes of PCE eligibility for the current fiscal year. (Ex: Population figures deemed certified on 7/1/14 will be used by the AEA for fiscal year 2015)

G. Enter the number of customers your utility has in this space; listing each class separately. Customers that you do not charge for power, but are given power, should be written in the Unbilled/Donated space. Every customer should be listed on the customer ledger even if they are not charged for the kWh's used.

H. Record the **TOTAL** number of kilowatt hours generated by each generation source (i.e. *Diesel, Hydro, Wind or Natural Gas*) in the appropriate field. To calculate the **TOTAL** number of kilowatt hours ("kWh") generated you must know the current "master meter" reading and your prior month's master meter reading. Subtract the prior month's reading from the current month's reading to get the total number of kWh's generated by the plant for the current month. Enter *that* number for the total kWh generated. **If your master meter uses a multiplier, YOU must multiply the figure derived from this calculation beforehand.**

Ex: (Present Reading – Previous Reading) x Multiplier = Total kWh Generated

This calculation should be performed for each generation type and the total listed.

I. Enter the total kilowatts purchased during the reporting period (if any) in this space. This would apply only if you purchased power from another power producer.

J. Write the name of the vendor from which you purchased power in this space.

K. If any of your power is generated via any other source than those listed above, calculate the total number of kWh's generated from this source and enter that number in this space. (same as above, only using this alternative generation type)

L. Enter the **TOTAL** number of kWh's generated **PLUS** those purchased (if any) in this space.

If your utility generates kW's using a combination of diesel, hydro, wind and/or natural gas, as well as any "other" alternative energy source, you would include the total of these kWh's **plus** any kWh's purchased in this space.

This number will represent the total number of kWh's available for sale to your customers and available for use by your utility; otherwise known as station service.

M. Write the price of fuel, per gallon, **that was used by the RCA to determine your PCE level**, as well as the date approved by RCA. This information is included in the letter orders sent to you from the RCA that tells you what your PCE level is. It is usually contained in Appendix 2 of the letter. If you cannot find it or are unsure, please contact the RCA at 907-276-6222 or toll free at 1-800-390-2782.

NOTE:

THIS price per gallon may be different from the price you paid for your most recent fuel purchase. For purposes of PCE reporting you are to list the price per gallon used by the RCA when figuring the current pce levels being used.

N. Write the total amount of fuel used during this reporting period in this space. This is **NOT** the amount of fuel purchased; only the amount of diesel fuel consumed by your generator(s).

O. Enter the total cost of fuel used during this reporting period. This is the actual number of gallons of fuel **USED** by your utility during this reporting period multiplied by the price per gallon **that was used by RCA to determine your PCE level**.

Ex: (Price of fuel used by RCA to determine PCE rate) x Fuel Used = Total Fuel Cost

P. Write your total non-fuel expenses in this space. These expenses would include salaries, postage, office supplies, travel, parts, etc.

Costs that are out of the ordinary, such as large generator parts, equipment and annual insurance premiums may need to be amortized. Contact the staff at the RCA with questions regarding how these costs should be included or whether to include them at all.

Q. Write the number of station service kWh's used in this space. When we ask for station service kWh's, there is a meter in your powerhouse or plant that measurers this number. If you have questions about how to obtain this number, please call the Alaska Energy Authority at 907-771-3000 or toll free at 1-888-300-8534 for further instruction.

R. From the plant log, document the highest peak demand reading recorded during the current month. This "peak demand meter" should be reset at regular intervals. If you have questions about how to obtain this number, or how to reset your peak demand meter, please call the Alaska Energy Authority at 907-771-3000 or toll free at 1-888-300-8534 for further instruction.

S. Write the amount of kWh's sold to each customer class in these spaces. The sum of the numbers of kWh's for each customer class will be your "Total Sold". This information *should* match the customer ledger submitted with your monthly report.

T. Enter the "Total kWh Available" **minus** the sum of the "Total Sold" and kWh's used by your facility as station service in this space. Since it is impossible to sell more kilowatts than you have available, this figure should **ALWAYS** be greater than zero.

(NOTE: *Special circumstances may apply if your utility is on a "tie-line" to another generation source. Contact the AEA if this number is less than zero*)

A utility's Line Loss is derived by dividing the number of kWh's in Section C-4 by the **total** number of kWh's available for sale found in Section B-1.

(These calculations are done automatically if you are using the Excel version of the utility monthly report form.)

SECTION D:

This section should **ONLY** include eligible kWh figures for the current billing cycle being reported. Prior period adjustments should NOT be listed in this section. Prior period adjustments are to be submitted for pre-approval. Once prior period adjustments are approved, they should be detailed in a separate attachment/cover letter and should include the appropriate supporting documentation. Contact the AEA directly with any questions regarding prior period adjustments.

U. Current residential rate before the PCE level is deducted. This is the **FULL** rate your residential customer would be charged for the first 500 kWh's if PCE did not exist. This rate includes the energy charge plus any surcharge or customer charge and is expressed in cents per kWh using four decimal places. (Example: 0.4850)

V. Write only the number of residential kWh's that are eligible for PCE credit this space. This information should match the customer ledger submitted with your report.

W. Forms for the fiscal year 2013 or later will have the community's maximum number of eligible community facility kWh's pre-printed for your convenience. PCE credits are not to be given to community facilities in excess of this amount. Per AS 42.45.110(b)(1), this figure is derived by multiplying the community's population by 70.

Ex: 655 x 70 = 45,850 kWh's

X. Enter only the number of community facility kWh's that are eligible for PCE in this space. This information should match the customer ledger submitted with your report.

Y. Enter the total PCE eligible kWh's for both classes in this space. These figures should match the customer ledger's figures submitted with your monthly report.

Z. Write your current PCE level in this space. In most cases, this is found on your most recent letter from the RCA. If you are unsure of your current PCE level, please contact the RCA at 907-276-6222 or toll free at 1-800-390-2782.

AA. Write the amount, in dollars ($), that you are requesting from the Alaska Energy Authority as PCE credit for the month. This information should reconcile to information on your customer ledger. Your customer ledger amounts (amounts of credit given to your eligible customers) should reconcile to this number.

BB. An **ORIGINAL** signature of the person who is authorized to sign the monthly PCE report is required in this space. Reports without an original signature will not be processed until an original signature is received in our office. It is not necessary to fax your PCE report to the Authority, as it cannot be processed until an original signature is received.

CC. Enter the date the authorized individual signs the form in this space.

NOTE: This information should be submitted to the Authority within 10 days after the billing period ends.

DD. Write the billing period in this space. This date should be the same as the billing period listed on page one (1) of the report.

EE. List, in detail, the names of all community facilities you are requesting PCE credit for in these spaces.

FF. The number of kWh's being claimed for the community facilities should be entered in these spaces.

GG. Write the total number of kWh's being claimed for the community facilities in this space. This total should then be transferred to the appropriate space on page 1 (see legend for page 1, item "X").

HH. Write your current PCE level in this space.
[Remember: Prior period adjustments are not listed here]

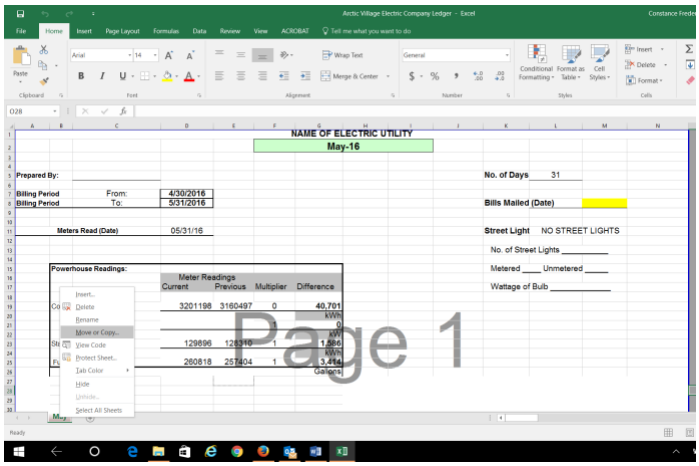
II. Write the sum of the total number of community facility kWh's multiplied by the current PCE level in these spaces.

JJ. Street light calculations for unmetered lights should be performed in this space. Once you have calculated the total kWh's for the streetlights and if they are eligible for PCE credit, you should enter this figure in the community facilities columns above. If they are not billed they are not eligible and should be documented as an unbilled customer on the PCE report. Streetlights should also be listed as a customer on the customer ledger in the proper classification.

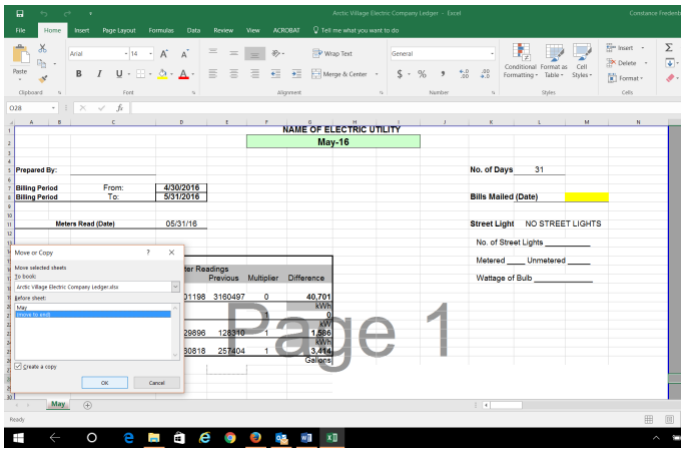
Directions for Creating New Monthly Ledger from Previous Month's Ledger

Make sure the Previous Month's Ledger is complete and correct before using it to create the new month's ledger.

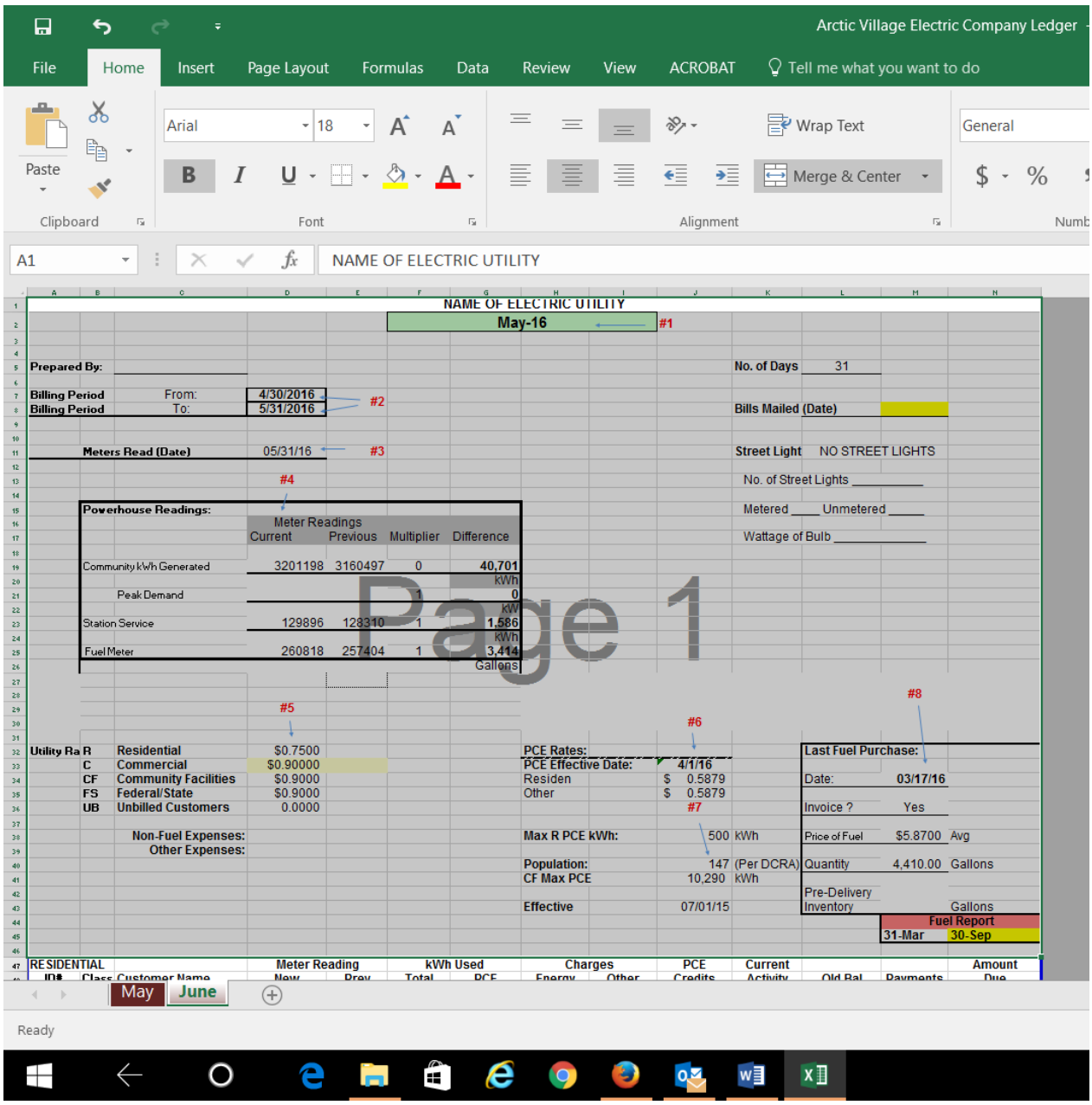
Right click on the tab at the bottom of the excel spreadsheet for previous month. Select "Move or Copy"



Check the box "Make a copy" and highlight "(move to end)" then select "OK"



Right click on the tab at the bottom of the new spreadsheet, select "Rename" and change the name to the current month.



1. Change the date at the top of the ledger to the current month for readings
2. Change the Billing Period dates to reflect the new dates for the current billing period
3. Change the Date Meters Read to reflect actual date of meter reading
4. Under Powerhouse Readings
    a. Highlight and copy the Current Meter Readings for all sections (Community kWh Generated, Peak Demand, Station Service and Fuel Meter) and Paste Special (values) onto Previous Meter Readings.
    b. Enter Current Readings for each section
5. Make sure the Customer Rates are Correct.

6. Make sure the PCE rate is correct and document the date it was first implemented.
7. This section only needs to be updated annually on July 1st. AEA will send your utility the latest population figures from DCED. This number is multiplied by 70 to determine the maximum number of kWhs that can be covered by PCE each month.
8. Enter the information for the most recent fuel purchase. As a reminder, note dates the RCA has given the utility for submitting fuel reports.
9. Do the following tasks for each Rate Class:

MAKE SURE TO DO THEM IN THIS EXACT ORDER! If you don't start with Amount Due being pasted to Past Due as a value, the Amount Due will change and not be correct.

   a. Select then Copy the Amount Due column corresponding to all customers in the rate class (unless the page ends and a header is at the top of the next page – if so, do the next section separately)
   b. Paste Special (Values - NOT formulas) into Old Balance column
      i. Do not include totalizing cell at bottom of each rate class when copying and pasting.
   c. Select the Payment Column, right click and select "Clear Contents"
   d. Select and Copy the New Meter Readings Column
   e. Paste Special (Values) onto Previous Meter Readings Column
10. Enter Current Meter Readings and Payment information for each Rate Class.

Mail Merge Directions for Creating Electric Bills (*available upon request*)

Motor Fuel Tax Exemption Form

http://tax.alaska.gov/programs/programs/forms/index.aspx?60210

Choose the form as shown below: **Certificate of Use**

538 Certificate of Use Fill In

Fuel Testing Labs

Glycol

Delta Western Robert Arcello or Charles Lechner (907) 343-1231 rarcello@deltawestern.com

Shoreside Petroleum Joel Lawrence (907) 830-8204 joell@petro49.com

Fuel

Intertek 354 Fairbanks St. Valdez, AK 99686

+1 (866) 835-4331 (toll free)

+1 (907) 835-2093 (fax)

+1 (907) 831-0004 (mobile)

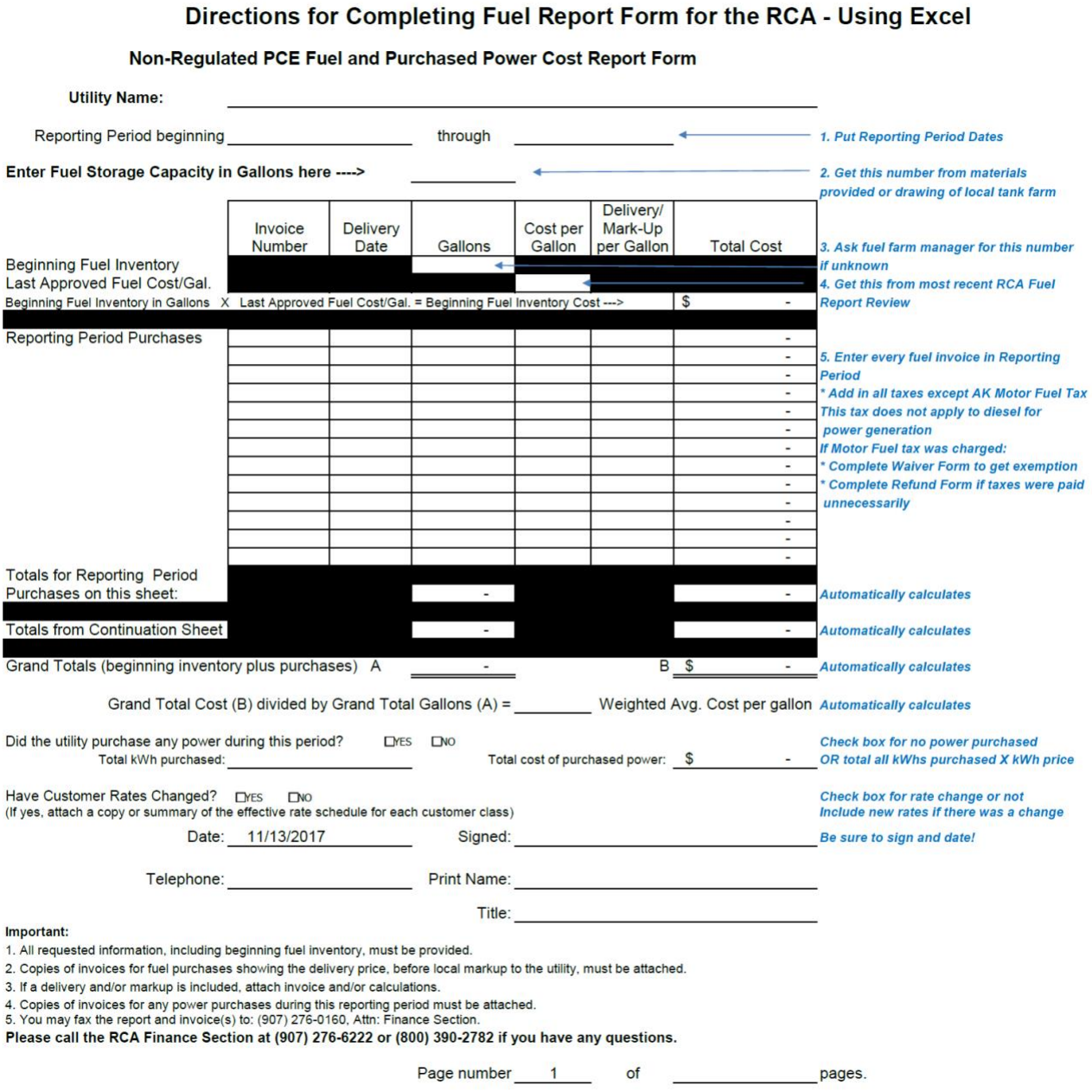
Distillation (D86) $168.00

Density (D4052) $69.60

Calculated Cetane (D4737) $47.40

Total for the 3 tests $285.00

Directions for Completing Fuel Report Form for the RCA



Directions for Completing Fuel Report Form for the RCA - Using Excel

Non-Regulated PCE Fuel and Purchased Power Cost Report Form

Utility Name: _____

Reporting Period beginning _____ through _____ ← *1. Put Reporting Period Dates*

Enter Fuel Storage Capacity in Gallons here ----> _____ ← *2. Get this number from materials provided or drawing of local tank farm*

	Invoice Number	Delivery Date	Gallons	Cost per Gallon	Delivery/ Mark-Up per Gallon	Total Cost	
Beginning Fuel Inventory							*3. Ask fuel farm manager for this number if unknown*
Last Approved Fuel Cost/Gal.							*4. Get this from most recent RCA Fuel Report Review*
Beginning Fuel Inventory in Gallons X Last Approved Fuel Cost/Gal. = Beginning Fuel Inventory Cost --->						$ -	
Reporting Period Purchases						-	*5. Enter every fuel invoice in Reporting Period*
						-	** Add in all taxes except AK Motor Fuel Tax This tax does not apply to diesel for power generation*
						-	*If Motor Fuel tax was charged:*
						-	** Complete Waiver Form to get exemption*
						-	** Complete Refund Form if taxes were paid unnecessarily*
						-	
						-	
						-	
						-	
						-	
						-	
						-	
						-	
						-	
						-	
						-	
Totals for Reporting Period Purchases on this sheet:			-			-	*Automatically calculates*
Totals from Continuation Sheet			-			-	*Automatically calculates*
Grand Totals (beginning inventory plus purchases) A			-		B	$ -	*Automatically calculates*

Grand Total Cost (B) divided by Grand Total Gallons (A) = _____ Weighted Avg. Cost per gallon *Automatically calculates*

Did the utility purchase any power during this period? ☐YES ☐NO *Check box for no power purchased*
Total kWh purchased: _____ Total cost of purchased power: $ - *OR total all kWhs purchased X kWh price*

Have Customer Rates Changed? ☐YES ☐NO *Check box for rate change or not*
(If yes, attach a copy or summary of the effective rate schedule for each customer class) *Include new rates if there was a change*

Date: 11/13/2017 Signed: _____ *Be sure to sign and date!*

Telephone: _____ Print Name: _____

Title: _____

Important:

1. All requested information, including beginning fuel inventory, must be provided.
2. Copies of invoices for fuel purchases showing the delivery price, before local markup to the utility, must be attached.
3. If a delivery and/or markup is included, attach invoice and/or calculations.
4. Copies of invoices for any power purchases during this reporting period must be attached.
5. You may fax the report and invoice(s) to: (907) 276-0160, Attn: Finance Section.

Please call the RCA Finance Section at (907) 276-6222 or (800) 390-2782 if you have any questions.

Page number 1 of _____ pages.

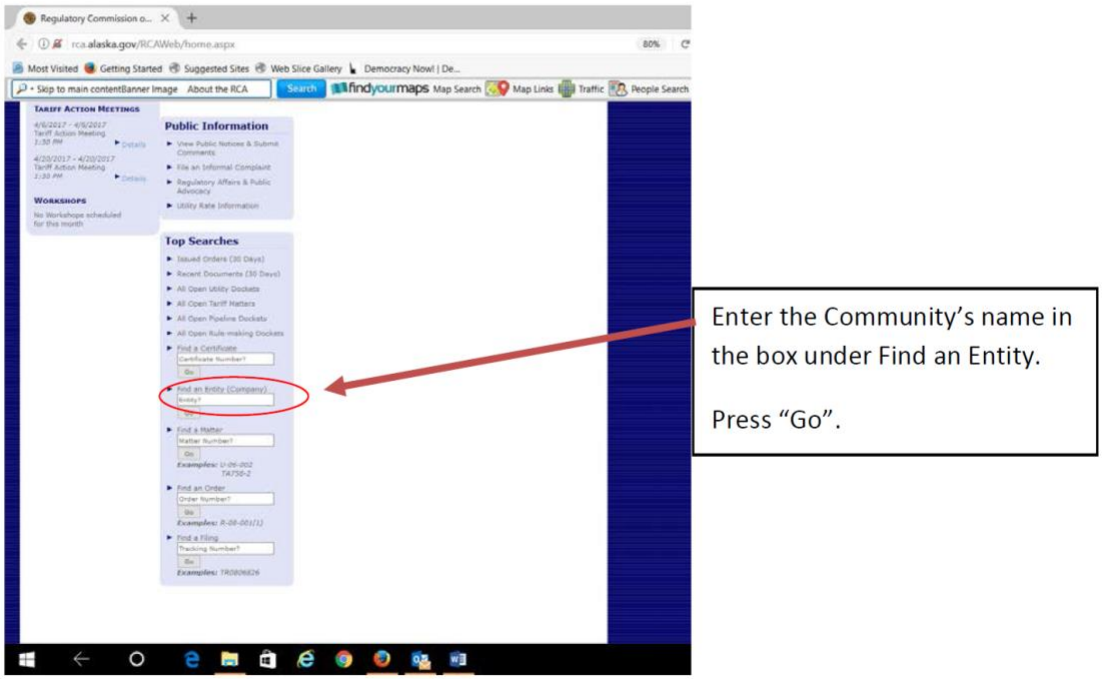
Directions for Navigating the RCA Website to Find Documents

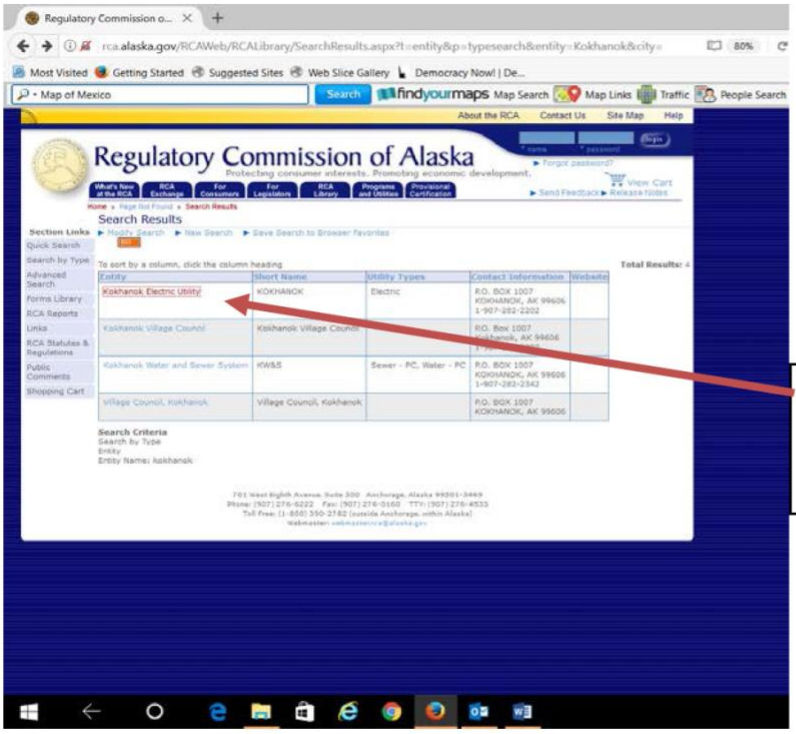
How to Navigate the RCA Website to Documents Filed or Received

www.rca.gov

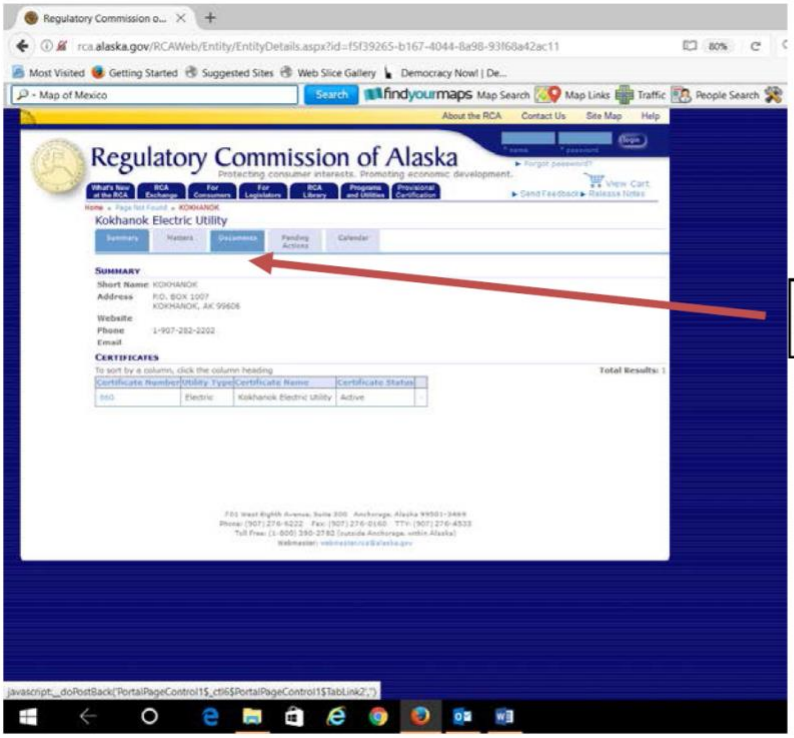
Learning to navigate the RCA website is well worth the effort. Reports submitted by your utility and all correspondence from the RCA to your utility are on this website. It is all public information.

Go to the RCA website and you will see this at the bottom half of their home page.

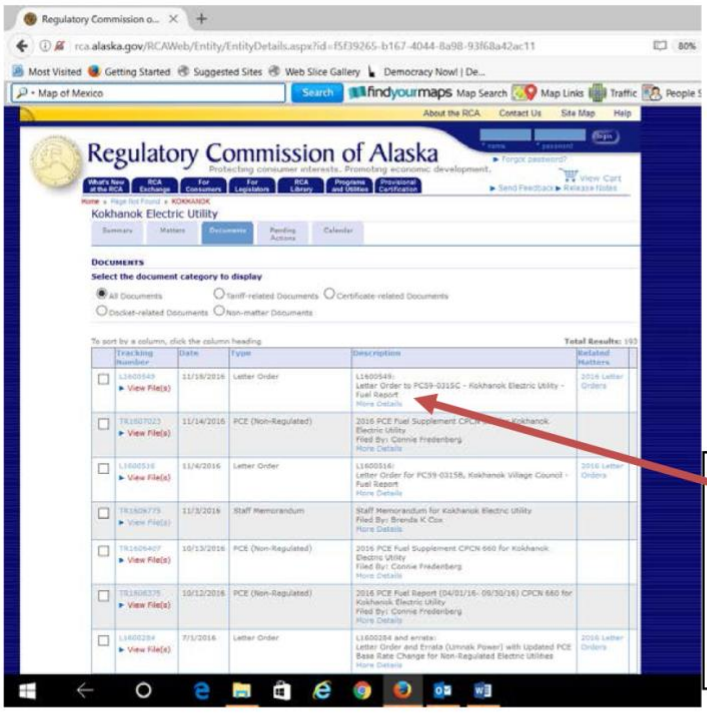




Select the Electric Utility from the list of regulated entities that appears for the community.



Select the documents tab



Search for the most recent Letter Order relating to a Fuel Report, Annual Report, or PCE Rate Change. Find reports previously submitted by the utility.

This part can sometimes be hard because the titles under the Description column are not always consistent and are sometimes misleading. Just keep looking for what you want.

The RCA sends **Letter Orders** whenever new PCE levels are approved. You can download any Letter Order or document you want as a pdf, save the file to your documents, and/or print one for your records.

Utility Expense Examples

- **Personnel**
  - Wages/Stipends
  - Employer Taxes
  - Workman's Compensation Insurance
- **Electric Operating Expenses**
  - Purchased power
  - Generator Oil (*Delo 400/Lube Oil*)
  - Generator Filters (*oil, fuel, air*)
  - Generator Repairs/Maintenance (*parts and the freight for those parts*)
  - Tools (*shovels, wrenches, kits*)
  - Equipment Rental (*even if rented from local City, Tribe, or Corporation*)
  - Other (*ex: brush cutting, fire extinguishers, coolant*, *motor gas*, *utility vehicles or heavy equipment*)
- **Electric General/Admin Expenses**
  - Outside Professional Services (*lawyers, accountants, bookkeepers, engineers*)
  - Insurance (*property, workman's comp can be included here or in personnel*)
  - Office Supplies
    - *paper/pens/printer ink/staplers/staples/file folders, etc.*
    - *printers/copiers/computers (equipment over $500 must be depreciated)*
  - Postage (*stamps, any dealing with post office)*
  - Office Rent
  - Travel (*must be related to business or training – include per diem, car rental*)
  - Training (*Rural Energy Conference, AVTEC, AMPY, PCE, Utility Board, etc.*)
  - Bad Debt Expense (*bounced checks, unpaid electric bills to be written off*)
  - RCA Fees (*for $471 Annual Report and $39 Fuel Report Reviews*)
  - Other
    - *Phone/Fax/Internet*
    - *Utilities for Office*
- **Other Expenses**
  - Interest (*Fuel Loan, Power Project Loan*)
  - Depreciation
    - *Costs for or a new or improved building, a piece of equipment, or major repairs to generation or transmission – something that should last many years - must be divided up by however many years the item is expected to remain useful. This fraction of the cost is how much can be counted as an expense in any one year. RCA list of common items and expected lifespan is included with this lesson.*
    - *Amortized items are also included in this category – say you purchase a large quantity of supplies that get used up (such as lube oil or filters), but this quantity will last for more than one year. You must estimate how many years the quantity will last and divide the cost up by that number of years.*

Depreciation Lives per RCA

Generators	14	7%
Transformers	20 - 25	4% - 5%
Poles, Towers	25	4%
Overhead Lines	25	4%
Underground Conduit	25	4%
Meters	20 - 25	4% - 5%
Services	25	4%
Buildings	30	3.33%
Office Equipment	10	10%
Vehicles	4 - 6	16% - 25%
Fuel Tanks	15	6.66%
Computers	6	16.67%
Street Lights	20	5%
Power Stat Meters/Displays	10	10%
Small Engines	5	20%
Amortization: (Suggested)		
Top End Generator Overhaul	3	33.3%
Full Generator Overhaul	5	20%
Training	3 – 5	20% - 33.3%
Oil Spill Clean up	3 – 5	20% - 33.3%

Power Cost Equalization Program Contacts for Reporting

Alaska Energy Authority/AEA

Contact: Jeff Williams
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503
Direct Line: 907-771-3046
jwilliams@aidea.org

Utility Monthly Report/UMR

- Signed copy due via USPS on the 10th of each month. Includes generation, usage, expenses, and collection figures for the prior month. *All information should come from the same time period as bracketed by the actual customer meter reading dates.*
    - If submitted after the 10th, it will be processed after all those submitted on time.
- Consists of:
    - Complete Monthly Customer Ledger
    - Utility Monthly Report Form (UMR)
    - Copy of (1) Residential Bill
    - Copy of (1) Community Facility Bill
    - Plant log (upon request)

Regulatory Commission of Alaska/RCA

Contact: Brenda Cox
Regulatory Commission of Alaska
701 West Eighth Ave., Ste. 300
Anchorage, AK 99501
Direct Line: 907-263-2131
Fax: 907-276-0160
Brenda.cox@alaska.gov

Fuel Report

- Signed copy due via USPS or fax ATTN: Finance Department
    - Due dates vary based on delivery frequency
        - Contact Brenda Cox if unsure of dates for your utility

Annual Report

- Signed copy due via USPS
    - Reporting dates vary
        - Contact Brenda Cox if unsure of dates for your utility